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ABSTRACT

A project focused on further verification and development of a set of previously recommended vocational education indicators. These indicators were employer's satisfaction with the quality of the graduate's work, number of graduates employed in occupations related to program, labor market demand, number of graduates employed, training-related occupations, and program cost. One of the directions taken was further verification in terms of (1) current social and economic issues, (2) vocational education as part of education more broadly conceived, and (3) critical questions useful in interrogating any potential indicator. Another project direction focused on further development of indicators with adequate data available and proceeded through the steps of defining indicators, displaying information, setting benchmarks, and combining indicators. A third project direction involved analysis and recommendations concerning indicators without adequate data. Emphasis was on assessing the types of data available, directions of current research and development to improve the data, making best use of what is available, and suggesting further ways of improvement. The two recommended potential indicators that served as content on which these developmental efforts were illustrated were labor market demand and training-related occupations. (YLB)

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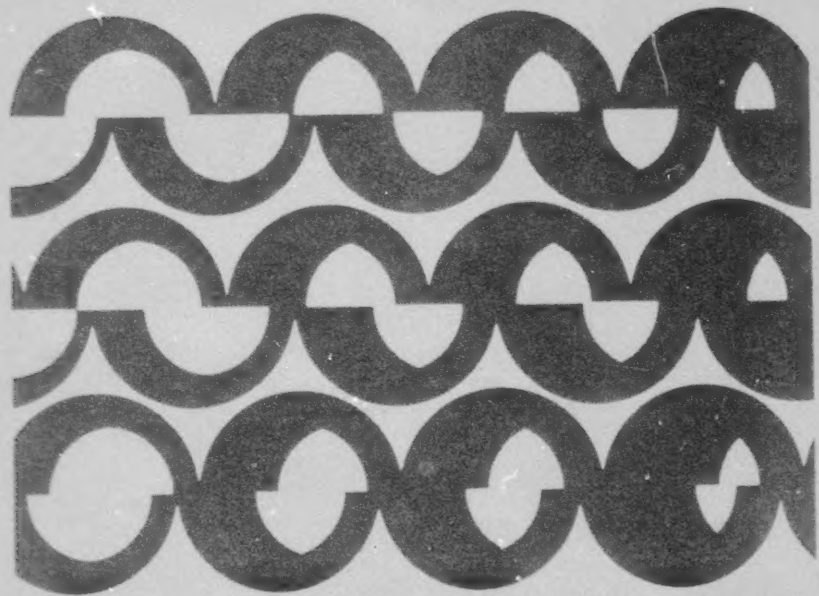
Developing Vocational Education Indicators:

Some Steps in Moving from Selection to Use

By George H. Copa, Steve Scholl



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St. Paul, Minnesota

September, 1983

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PREFACE

The authors express special thanks to the members of the Vocational Education Indicators Work Group who provide direction, constructive suggestions, critical assessment and motivation during the course of this research and development effort. The members were: Deena Allen, Robert Babcock, Ronald Dreyer, Craig Froke, Rosemary Fruehling, Helen Henrie, William Hohenhaus, Leon Linden, and Joe Malinski. Their attendance and involvement during work group meetings as well as in special assignments was most appreciated and "made a difference" in what can be reported. Hopefully the interaction of the Work Group and what is reported here will find their way into the larger process of developing a mission statement, key result areas, and indicators for vocational education currently on-going in Minnesota.

This effort would not have been possible without the financial resources made available to the Minnesota Research and Development Center for Vocational Education by the Minnesota State Department of Education, Division of Vocational-Technical Education as authorized by the Minnesota State Board for Vocational Education. The encouragement of William Stock, our Project Officer, to involve practicing vocational educators in the effort was instrumental to whatever achievements are evident in this report and to a good deal of job satisfaction on the part of the authors.

GHC

ABSTRACT

The work reported in this publication is a continuation of the efforts described in a previous report entitled, Potential Vocational Education Indicators: Vital Statistics for Planning, Review and Public Information About Vocational Education in Minnesota. Project efforts focused on further verification and development of a set of vocational education indicators which were recommended in the previous report. However, project results, while using the previously recommended indicators as "grist for the mill", should be useful in thinking about indicator development more generally.

One of the directions taken during the project was further verification of indicators in terms of: (1) current social and economic issues, (2) vocational education as a part of education more broadly conceived, and (3) critical questions useful in interrogating any potential indicator. The conclusions based on this further verification were:

- A mission statement for vocational education in Minnesota which is specific and address major value conflicts is essential to indicator verification.
- A conceptual framework for vocational education which is consistent with the mission statement is necessary to provide a way of thinking and language (key concepts) with which to discuss indicator verification.
- Indicator verification must address questions of the meaning of concepts used, the ends implied and means of operationalizing the indicators selected for use.
- Indicators selected for general purposes in monitoring vocational education may need to be supplemented by indicators which are specific to particular purposes.
- The process of indicator verification must be continuous if indicators are to remain relevant to changing social conditions and technology.

Another project direction focused on further development of indicators with adequate data available and proceeded through the steps of operational definition, information display, setting benchmarks and combining indicators. Results of the developmental efforts lead to the following conclusions:

- Adequate operational definitions can be constructed for some indicators using existing information.

- Displaying indicators involves considerations of both structure and format as a means to be understandable, focused and parsimonious. A structure and format which seemed to meet these criteria was proposed and illustrated.
- Setting benchmarks for judging the adequacy of vocational education involves choosing appropriate comparisons. Appropriateness depends on purpose, process used, desired degree of responsiveness to external factors, and judgments of what is reasonable. Benchmarks become an integral part of indicator display and a basis for subsequent interpretation.
- Combining indicators allows focus on the inter-relationship between indicators and summary of general condition across several indicators.

A third project direction involved analysis and recommendations concerning indicators for which adequate data was not available to move ahead with the steps of further development suggested above. From the analysis of two indicators concerning labor market demand and training-related occupations, the following conclusions were made:

- While much labor market information is available, none is sufficiently specific, complete, or compatible with that available for vocational education programs for use in indicator development.
- It may be reasonable to use proxy measures of labor market demand derived from follow-up information on graduates of vocational education programs as a "stop-gap" mechanism in combination with existing labor market demand information until more adequate information is available.
- Little progress can be made in using labor market information to develop a relevant vocational education indicator until a consistent and stable set of occupations related to each program is specified. The use of existing "crosswalks" between occupations and programs, the concept of "units of analysis" and existing follow-up information on occupations judged "related" by students offer good possibilities to resolve the relatedness issue at least in terms of the best means to use for this purpose.

The overall results of pursuing these directions were the following recommendations for guiding further indicator refinement:

- The process of indicator verification and development must be continuous.
- The need for both reflective thought and experience are important to indicator development.
- Some of the indicators must be pushed to the stage of actual use in planning, reviewing and providing public information.
- Involvement of those using and affected by use of the indicators is a necessary part of indicator development.

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CHAPTER I.
INTRODUCTION TO FURTHER INDICATOR VERIFICATION AND DEVELOPMENT

The research and development activities described in this report are a continuation of those reported in the publication, Potential Vocational Education Indicators: Vital Statistics for Planning, Review and Public Information About Vocational Education in Minnesota (Copa & Salem, 1982). That publication reported on the results of a two year effort to identify a first set of potential vocational education indicators for use in Minnesota. The process of identification included a comprehensive review of literature on the process of selecting and developing social indicators, a survey of vocational education administrators in Minnesota at the local and state level concerning their judgment of the importance of various indicators and a series of mini-conferences with groups of administrators to verify and discuss those indicators thought to be most important. In addition to recommending a set of "best" candidates for an initial set of vocational education indicators, authors of the report suggested that the selected potential indicators: (1) under go further justification and (2) be moved to a pilot testing phase to determine the feasibility of their calculation, display, interpretation and actual use. The purpose of the research and development efforts reported in this publication was to move forward in the further justification and pilot testing process for the recommended potential indicators.

Process of Work

Early in the planning of the further verification and development process for potential indicators, a decision was made to focus on the post-secondary vocational education level and to involve those who would eventually be responsible for deriving and using vocational education indicators. The focus on post-secondary vocational education was selected because of a high level of interest and pressing need (by legislative mandate) for the development of a set of indicators at that level to guide and formalize the planning process for vocational education programs, particularly, on a statewide basis. (Initial plans for this project had focused at the local level with a sample of schools and programs; these plans were changed after discussion with and agreement by our Project Officer in the Minnesota Department of Education.)

Involvement of vocational education managers was considered essential based on the review of efforts to develop social indicators in other fields of social endeavor. From this review of past ideas and experience, it was evident that if the indicators were ever to be accepted and carry some weight in actual decision making, those who would be using them needed to be involved in the verification and development process. Further, it was suggested that those who would be responsible for producing the indicators on a regular basis and who have a "working sense" of what is possible given available data and resources must be involved if the importance, general purpose and nuances of the indicators are to be understood and worked into the indicator production process. Last, it was judged important to involve those who would bear the consequences of decisions made using selected indicators as a major decision making factor. These individuals would be particularly important to discussions concerning the adequancy of the indicators in covering important aspects of vocational education, in how the indicator is finally defined in terms of available data and in interpreting what the indicator communicates and hides.

Using these guidelines, a Vocational Education Indicator Work Group was convened to assist in selecting a direction for the research and development efforts and to critically review the results of project work. The members of the Work Group were:

- Deena Allen, Supervisor, Teacher Education, CETA & Vocational Equity, State Department of Education;
- Robert Babcock, Specialist, Program Management and Budgeting, State Department of Education;
- Ronald Dreyer, Management Information Specialist, State Department of Education;
- Craig Froke, Assistant Director, Minneapolis Vocational Technical Institute;
- Rosemary Fruehling, Manager, Post-Secondary Vocational Education Section, State Department of Education;
- Helen Henrie, Technical Upgrading Specialist, State Department of Education;
- William Hohenhaus, Agriculture Vocational Programs Specialist, State

Department of Education;

- Leon Linden, Director, St. Paul Technical Vocational Institute; and
- Joe Malinski, Planning, Research and Fiscal Control Director, Hennepin Technical Centers.

The long and short term purposes of the vocational education indicators research and development effort conducted by the Minnesota Research and Development Center for Vocational Education were discussed by the Work Group at its first meeting. The short term purposes formed the context for Work Group discussions and project work during the three month period of the project. The purposes were as follows:

Long Term:

1. Identify a set of vocational education indicators which should be used to plan, review and provide public information about vocational education in Minnesota.
2. Develop and test procedures for producing and communicating the selected vocational education indicators.
3. Provide assistance in using the vocational education indicators to maintain and improve vocational education in Minnesota.

Short Term:

1. Select a series of "next-steps" in the identification and development of indicators.
2. Begin to implement those next steps which are feasible and of high priority.

The specific purposes of the Work Group in light of these overall project purposes was also discussed and agreed to at the first Work Group meeting. The purposes for the Work Group were as follows:

1. Become aware of the progress which has been made on the development and use of indicators.
2. Advise on the direction (next-steps) to be taken in further development and use of indicators.
3. Become involved in at least one aspect of the development or use of an indicator.

The Work Group met three times during the course of the project, each meeting lasting approximatley two and one-half hours. The general process of work was for the Work Group to advise on project direction, for the research and development staff to make decisions on advice and follow through on project activities, and finally for the Work Group to critically review the results of activities. The flow and focus of the process of work is reflected in the Work Group meeting agendas shown in Appendix I.

Direction of Work

A major first step in the Work Group's activities was to review past research and development efforts related to developing vocational education indicators and to give advice on the specific direction of this project. The specific next steps for further vocational indicator development recommended in the previously cited report, Potential Vocational Education Indicators, were as follows:

- Further verification of indicators,
- Pilot testing of indicators with good data available,
- Developing data for indicators where data is not available,
- Developing a history of use of indicators to assist in their interpretation, and
- Developing a strategy to encourage use of indicators.

In addition the report identified six potential vocational education indicators as meriting further work on the basis of their apparent importance to vocational education administrators. These indicators were as follows:

- Employer's satisfaction with quality of graduate's work,
- Number of graduates employed in occupations related to program,
- Projected job openings in occupations related to program,
- Number of graduates employed,
- Occcupations for which program is designed to provide training, and
- Program cost.

Using the above recommendations as a starting point, the Work Group deliberated on most feasible project direction given the time and resources available. The Work Group recommended going ahead in three directions: (1) further verification of indicators, (2) further development of indicators with adequate data, and (3) further development of indicators without adequate data. These three directions provided the "advanced organizer" for project activities and, in seeming consistency, form the titles of the next three chapters of this report.

Within the direction of further verification of indicators, the Work

Group suggested and discussed several alternatives. The general purpose of this direction was to develop a greater sense of justification or confidence that the six recommended indicators were really important and whether or not other indicators should be added. Some of the alternatives discussed by the Work Group included: (1) relating indicators to the future trends in social and economic development of Minnesota and the United States as opposed to the present or past, (2) testing the responsiveness of the indicators to present and immediate short term happenings in Minnesota (e.g., budget deficits, mobility of firms, unemployment, declining enrollments), (3) relating indicators for vocational education to education conceived more generally (e.g., What ought be the basic purpose of vocational education as a part of education? What alternative directions for vocational education are responsible choices?), (4) checking the responses of vocational education administrators concerning the importance of various indicators with those of other groups such as teachers, students, parents, employers, school board members, and legislators.

From the comments and advice of the Work Group, it was decided to try two different strategies for further indicator verification. Those were to examine the implications of: (1) national issues where vocational education was considered to have an important role, and (2) basic alternative conceptions or ideas of the purposes of education. A third strategy, included after the Work Group had concluded its meetings, and therefore not discussed by them, was a critical examination of the types of questions needed to be raised about each potential indicator. The results of applying these strategies are reported in Chapter II.

The direction taken within the area of further indicator development for those indicators with adequate data was most straight-forward. The next steps seemed to follow a logical order of implementation entailing: (1) operationally defining and deriving the indicator, (2) displaying the indicator, and (3) setting benchmarks for indicator interpretation. In addition, there was concern about the relationship among indicators and how to summarize their overall message; this resulted in an examination of means of combining indicators. It was decided that four of the recommended potential indicators had adequate quality of data for post-secondary vocational education program to merit further development as described above. These indicators were: (1) employer's satisfaction with quality of graduate's work, (2) number of graduates employed, (3) number of graduates employed in occupations related to program, and (4) program cost. The results of further development of these indicators are described in Chapter III.

The last major direction concerned further development of indicators without adequate quality of data. Here the focus was on assessing what types of data were available, directions of current research and development to improve the data, making best use of what is available, and suggesting further ways of improvement. Two of the recommended potential indicators served as content on which these developmental efforts were illustrated. The indicators were: (1) projected job openings in occupations related to program and (2) occupations for which program is designed to provide training. Results of project work in this direction are reported in Chapter IV.

What was learned about the continued development of vocational education indicators as one looks across all of the research and development work conducted as part of this project is described in Chapter V. Each of the recommendations made there should serve as motivation and direction for further programmatic work toward developing cogent vocational education indicators in Minnesota.

CHAPTER II.
FURTHER VERIFICATION OF INDICATORS

As described in the previous chapter, one of the directions taken in this research and development effort was to further question the appropriateness of the indicators selected as most important in the Vocational Education Indicators report. More specifically, it was decided to test the appropriateness of these indicators by three kinds of strategies. (There were several additional approaches which could have been used but time and financial resources did not permit their use.) The three strategies used, only two of which were reviewed with the Vocational Education Indicators Work Group, were: (1) an analysis of current social and economic issues facing the nation and their implications for vocational education indicators, (2) an examination of various views of the purpose of education and their implications for indicators and (3) a critical analysis of a selected indicator -- number of graduates employed in occupations related to a program (training related placement). While these verification strategies do not represent a comprehensive test of indicator appropriateness, they do provide at least a limited perspective of strengths as well as shortcomings to the indicator previously selected as important.

Current Social and Economic Issues

Vocational education in this country is currently undergoing a very detailed investigation and considerable thought in preparation for new federal authorizing legislation. In this context, those who practice vocational education have been developing a national agenda for vocational education over the next five years which relates vocational education to the important social and economic issues faced by our nation. The American Vocational Association (1981) has taken the leadership to bring vocational educators from all levels (e.g., teacher to administrator, local to federal) across the country, together with representatives of business and industry and other governmental agencies with an interest in employment and training to work on the agenda. The effort has taken 2-1/2 years, 10 task forces, hundreds of individuals and many person-hours. This agenda, composed of six items, will be used to highlight how vocational education can be responsive to major current social and economic issues. As such, it represents the direction likely to be taken by vocational education in the next few years. The items are not all new but are to receive renewed attention. For each agenda item, a brief "job description" of the problem to be addressed by vocational education will be provided. This is followed by a suggested set of indicators which might be used to monitor the degree of attention and impact of vocational education on the identified social and economic concerns.

Strenthening Vocational Education in Depressed Communities

The first agenda item for vocational education is strengthening vocational education in depressed communites. The job description is to improve the employment-related education of people living in economically depressed inner cities and rural communities--these are the places which have least capacity to improve on their own. Suggested indicators of attention and impact on this concern are:

- Percentage of businesses rating vocational education important in relocation/expansion;
- Percentage of short-term programs requested by businesses for relocation/expansion; and,
- Change in funds for vocational education located in depressed areas.

Meeting the Nation's Needs for Qualified Workers

The second national agenda item for vocational education is meeting the nation's needs for qualified workers. The job description here is to prepare people in sufficient numbers and quality for the hard-to-fill jobs -- shortage occupations. Some job titles which often fit this description are in the machine trades and computer technologies. Articles on the re-industrialization of America or bottlenecks to rebuilding our defense capabilities often cite the lack of trained people for these occupations. Other job titles likely to fit here are the fastest growing jobs (e.g., bank clerks, guards, industrial machine repairers, licensed practical nurses and teacher aides) and jobs with the most average annual openings (e.g., secretaries, retail sale workers, cashiers). Indicators for this agenda item could be:

- Percentage of students enrolled in programs leading to "shortage" occupations;
- Percentage of students in surplus occupations, and
- Ratio of the number of graduates from a program compared with job openings in occupations related to the program.

Keeping the Basic Programs of Vocational Education Relevant

The third national agenda item for vocational education is keeping the basic programs of vocational education relevant. The challenge for the manager of vocational education here is to keep the staff, curriculum, equipment and facilities up-to-date with the changes in industrial technology. It is exactly the same challenge facing the manager of any enterprise concerning the issue of productivity. In keeping the basic program of vocational education most productive, some indicators might be:

- Employer satisfaction with the quality of graduates' work;
- Student satisfaction with the instructor, curriculum, and equipment; and
- Percentage of program rated up-to-date by advisory committee members of evaluation teams.

Conserving and Producing Energy

The fourth agenda item for vocational education involves its role in conserving and producing energy. The job description is to help develop the capacity to conserve energy and develop domestic renewable and non-renewable resources by translating the know-how evolving from research into widespread practice by industries and individuals. Two indicators for vocational education relevant for this agenda item might be:

- Percentage of students enrolled in programs leading to employment in energy related industries; and
- Percentage of students enrolled in programs leading to alternate energy/energy conservation occupations.

Serving Groups with Special Needs

The fifth agenda item for vocational education is helping groups that need more (special) services to be successful in the labor market. These are the hard-to-employ (earlier the focus was on the hard-to-fill jobs); however, the focus here is on people. Some of the hard-to-employ include youth, displaced older workers, the handicapped, displaced homemakers, offenders and (resident) aliens. The indicator here might well be very specific to each of these groups:

- Percentage of program enrollees with various special needs;
- Dollars (or percent of budget) spent on special services; and
- Number of special services.

Responding to the Nation's Equity Goals

The sixth and last item on the national agenda for vocational education is responding to the nation's equity goals. This job description means assisting in the process of obtaining better jobs for those who have been denied these jobs in the past because of race, sex or national origin. Possible indicators regarding equity in vocational education might be:

- Percentage of enrollees with each equity concern;
- Percentage of enrollees with equity concern in a representative sample of programs;
- Percentage of enrollees with equity concern in programs traditionally not enrolling these students; and
- Percent of programs in which enrollees with equity concern are enrolled 25% more than their proportion of the student body.

Discussion

As one reads the indicators which have been posed for these agenda items, it is apparent that the information needs go well beyond simple placement rates. There are information needs that are not likely to be answered by a simple computer printout of one data base. Rather there is a need for the integration of data from several sources, a narrative analysis by someone who is informed about vocational education and the larger social and economic culture of our nation, and in the end, it is likely to require face-to-face interaction between vocational educators and others involved in human resource development. While some of the indicators are the same as or related to the indicators previously selected as important, many are different and represent alternative positions as to what is important to know about vocational education. Differences in indicators might well be expected since the indicator's suggested in this section are tuned to particular purposes while those selected earlier were to be of a more general use. However, these differences should cause some concern and hesitance in "locking into" a set of indicators without careful thought as to what one has and has not.

Vocational Education as a Part of Education

It is assumed that vocational education is one part of a grander educational plan for individuals and society. If this is true, it is reasonable to examine the implications of one's educational philosophy for identifying important indicators for planning, reviewing and providing public information about vocational education. Further, examination of some basic alternative educational philosophies should provide a rationale for alternative visions or ideas of vocational education and corresponding sets of indicators.

What follows is an analysis of the educational philosophies represented in the Vocational Education Indicators Work Group and a characterization of vocational education as it might be seen to best exist from the perspective of the different basic educational philosophies. A set of relevant indicators for vocational education is posed for each philosophic perspective.

Analysis of Educational Philosophies Represented in Indicators Work Group

The Minnesota Analysis of Beliefs in Education (Minnesota Department of Education) questionnaire was developed to help people identify the basic nature of their educational philosophy (see Appendix II). This questionnaire serves as an appropriate means to sensitize one to the issues involved in characterizing "good" educational programs from the various educational philosophic perspectives (i.e., idealism, essentialism, pragmatism, existentialism, and behaviorism).

The Work Group members were asked to complete the questionnaire; nine of the eleven members responded. The results are shown in Figure 1. The fine

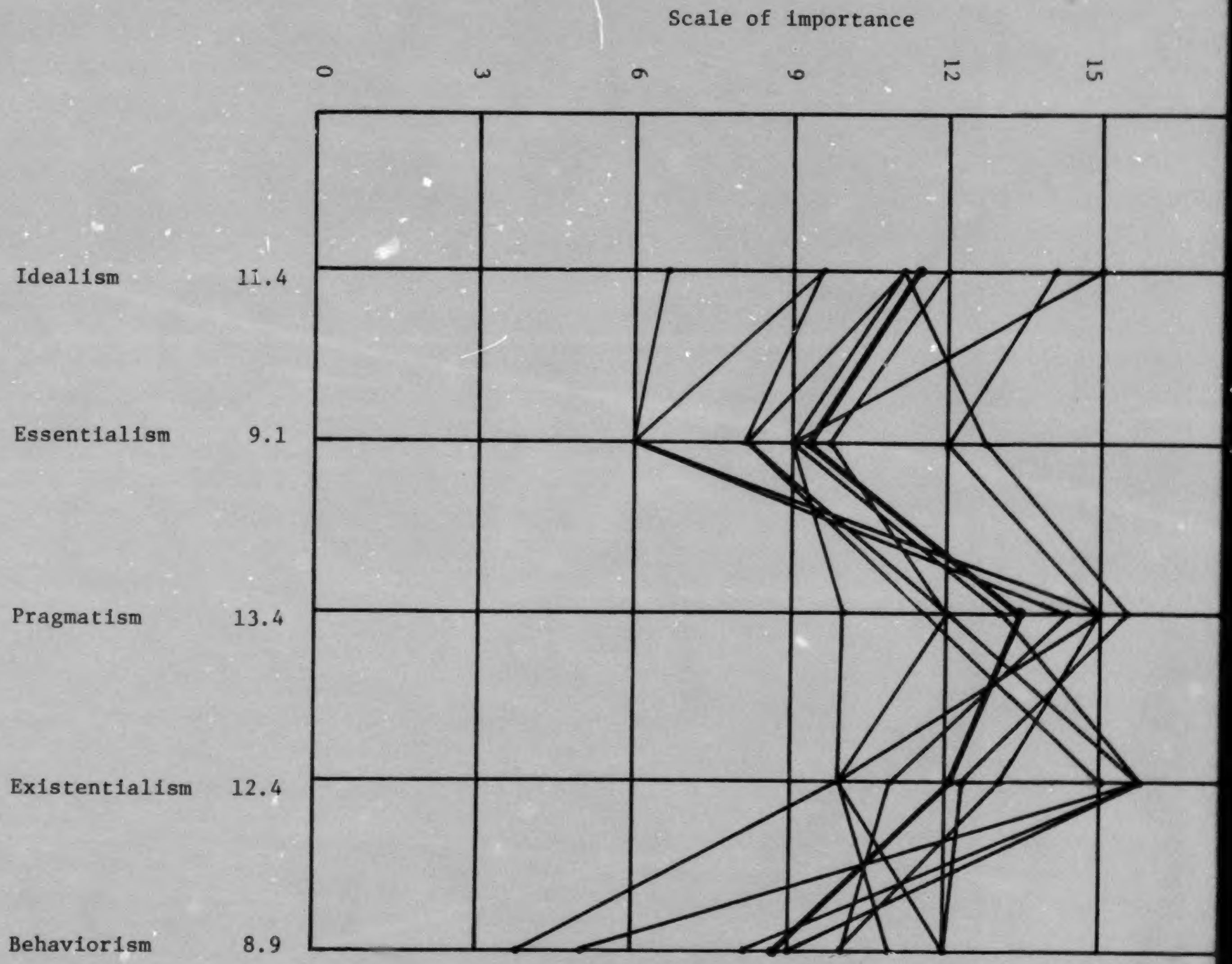

Figure 1. Minnesota Analysis of Beliefs in Education profile of Vocational Education Indicators Work Group.

lines represent individual responses, while the bold face line indicates the average response for the group. Each of the philosophic perspectives is represented to some extent in the average for the Work Group and in each of its members; this is as would be expected. It would be rare for an individual to be purely of one philosophy or another. However, as is evident in Figure 1, the pragmatism, existentialism, and idealism perspectives are held to a larger extent than that of essentialism or behaviorism. A brief description of the basic tenents of each philosophy is provided in Exhibit 1.

Vision of Vocational Education from Different Educational Philosophies and Implications for Vocational Education Indicators

Each of the educational philosophies differ in their basic presupposition about the nature of "being," about "knowing," and about "values." These differences in presuppositions, in turn, lead to different responses to educational questions such as: (1) What is the naure of the learning process, (2) How does the student learn, (3) What is the most appropriate or relevant subject matter, (4) What is the best method of teaching, and (5) What ethics or aesthetics need to be learned? The responses to these questions from each of several philosophic perspectives were outlined by Lerwick (1979). He went further to characterize vocational education from each perspective in terms of clientele, relation to community, administrative staff, architecture or facilities, curriculum, teaching, method of teaching and participation and evaluation criteria. These characterizations of vocational education were posed as "useful fictions" to stimulate thought and discussion about alternative concepts of vocational education.

The "useful fictions" as presented by Lerwick were drawn upon in this report in posing different visions for vocational education as a means to: (1) make specific to vocational education the consequences of holding a particular educational philosophy (as, for example, held by Work Group members) and (2) rationalize the very different possible reasoned visions for vocational education (and, therefore, the very different indicators important in planning, reviewing and providing public information about vocational education). This last purpose is especially relevant to the process of verifying a particular set of vocational education indicators as is being suggested in this report. One is confronted with the question, "What

Exhibit 1

Minnesota Analysis of Beliefs in Education
Descriptions of Philosophical Positions

The following are brief descriptions of the five philosphic positions used in the Analysis of Beliefs in Education inventory. While it is not possible to represent these five schools of philosophy adequately with a few statements, these general descriptions are provided as a means of underscoring the differences that exist among the philosophic approaches represented. There are many excellent texts available which detail these philosophical positions.

Idealism

This very early philosphic position maintains the dominance of the world of ideas over the world of sense reality. Therefore, emphasis is given to mental discipline, the development of ideas and concepts, and the search for universal truths.

It is the work of education, according to the Idealist to assist students in discovering the ideal truths that exist. This is commonly accomplished through such academic fields as history, mathematics, and literature.

The Idealist believes that absolute and unchanging values exist. These values are timeless and are found in each society and throughout history. Through the use of reason and logic, the human person can support belief in such values.

Essentialism

Essentialism takes its name from the fact that there exist certain essential knowledge and beliefs. This knowledge and these beliefs are knowable.

Typically the Essentialist position unites the main beliefs of two other philosohpical schools of thought: Idealism and Realism. Realism is a philosophic position which advocates the objective reality of our world.

Essentialism often has been linked with traditional religious beliefs. This results primarily from the Essentialist view of the student as a fugitive from learning--an assumption which correspond to the doctrine of original sin or the sin of Adam and Eve. In other words, human nature is thought to be inclined toward "evil." The instructor must practice consistent discipline in order to assist the student in developing the self discipline required for learning and a worthwhile life.

Exhibit 1 (Continued)

Essentialist view the teacher as a master of learning. There is a knowable body of knowledge that teachers share with students in leading them to become well-educated adults.

As with the Idealist position, Essentialism acknowledges the existence of absclute and unchanging values.

Pragmatism

This philosphic position is associated with the later progressive movement in American education. Pragmatists contend that truth is found in that which works. An idea is tested by examining its consequences; the degree to which the consequences are acceptable is the degree to which truth exists.

The Pramatist does not simply advocate something that is seen to be useful for an individual. Rather, truth is that which helps us move toward what is progressively good for our community or society.

In other words, truth is relative and will vary according to time and place. Therefore, for the Pragmatist there are no absolute or changeless truths or values, other than perhaps Pragmatism itself.

Reality, for the Pragmatist, is viewed as one's experiences. One's experience in trying to know or solve problems accounts for one's relationship is viewed as a process. In fact, the Pragmatist position is said to be process-oriented.

In education, the Pragmatic point of view encourages students to learn through experiences of the real world, both physical and social, and to solve problems associated with those experiences.

Existentialism

The Existential position focuses on the individual. Each person is thought to be unique and, therefore, efforts to impose group values upon the individual are not acceptable.

In order to cultivate and maintain the unique character of the individual, a high degree of personal freedom is required. The person is not in search of some ideal or absolute truth. The individual strives to come to know his/her own being and person. For it is in knowing who the individual is that he/she can determine what reality is.

Similarly, each individual, given personal freedom, determines the values that are important. It is obvious that this philosophic position is subject in its attention to the individual and to the individual's personal determination of truth and values.

Exhibit 1 (Continued)

In education, the Existentialist assists students to create their own unique existence and being, and to recognize and practice personal freedom. Through personally selected experiences, the individual grows in self knowledge and achieves self-fulfillment.

Behaviorism

Two separable aspects of a system which is derived from psychology are: Behaviorism as a philosophic position and behavioral engineering as a technology. The philosophic position asserts that the human person is conditioned in all phases of life to respond and react in certain ways. Knowing this, it becomes clear that the human behavior is not free, but rather is determined by environmental stimuli. In addition to being controlled by such obvious stimuli as those provided in our physical environment, we are also controlled by the stimuli managed by other human beings.

A stimulus can be either positive, as in a reward, or negative, as in punishment. It is believed that human behavior can be modified by establishing the "right" set of conditions. Certain members of society, usually those associated with the scientific/technological community, have the responsibility to identify the conditions which change behavior for the good of society and the individual.

Behaviorists generally are silent on the topic of values. That behavior which results in positively reinforcing stimuli is seen as good.

In eduation, the Behaviorist is keenly interested in maintaining the right set of conditions for producing learning, e.g., a learning environment in which correct behavior is followed by positive consequences. Stating specific behavioral outcomes of learning in some quantifiable way and modifying student behavior toward learning reflect the usual concerns and activities of those who subscribe to Behaviorism.

Source: Minnesota Department of Education. User's guide to accompany Minnesota Analysis of Beliefs in Education. St. Paul, MN.

educational philosophy is represented in the indicators under verification? Is this the educational philosophy which was intended? And, what other educational philosphies (and their relevant indicators) should also be included?"

Table 1 provides a brief characterization of vocational education from various educational philosophic perspectives and several indicators which seem consistent with each perspective. The labels given to the philosophies differs slightly between the Minnesota Analysis of Beliefs in Education questionnaire and the Lerwick report. The correspondence between labels is provided in Table 1. Lerwick added a sixth perspective, that of "reconstructionism," which is not included in the questionnaire but is made a part of Table 1.

Discussion

The purpose of this strategy to verifying the appropriateness of indicators previously selected was to step back and view indicators from a larger and more basic context -- that of education in total. The assumption was that one's vision of education has implications for the purpose held for vocational education, which in turn should consistently imply important vocational education indicators. This is a deductive approach to indicator verification. What is evident is that various educational philosophies suggest quite different visions for education (and vocational education and indicators). The analysis of Work Group participant's beliefs about education revealed that a combination of philosophies are held within and among even a small group of individuals concerned about vocational education. While acknowledging that an eclectic view seems to be held, it is alarming to note that the different educational philosohpies have conflicting basic presuppositions; that is, in the end when "push comes to shove" (as during a budget cutting process), the philosophies are not compatible and one would seem to have to go with one or the other.

An important implication of using the above verification strategy is that a statement of the overall purpose of vocational education in Minnesota -- a mission statement -- on which their is consensus is critical to deciding if a set of vocational education indicators are appropriate. A mission statement must address the basic questions about beliefs in education (either directly or, if indirectly, with clear implications) such as: (1) What is the nature of the learning process, (2) How does the student learn, (3) What is the most appropriate or relevant subject matter, (4) What is the best method of teaching, and (5) What ethnics or aesthetics need to be learned?

Table 1
Characteristics of Vocational Education From Various Educational Philosophic Perspectives and Likely Corresponding Vocational Education Indicators

Philosophic[a] perspective	Key features (symbols)	Noteable characteristics	Likely indicators
Perennialism (Idealism)	Excellence (blue ribbon, No. 1, A, grin of confidence, high achievement, good self esteem)	-Ideals should be taught -Craftpersonship -Quality, pride in work, durable products, quest for perfection, beauty -Role of work in history, culture, civilization -Develop conscientious, moral, intelligent workers -Teachers with mastery of skills, excellent role models -Students curious about larger issues -Develop thinking about reasoning skills -Evaluation based on standards of excellense	-Employer satisfaction with quality of work -Customer satisfaction with quality of work -Ratings in competitive technical demonstration events -Student satisfaction with quality of work able to produce
Essentialism	Basics (Paycheck, oak tree, basic tools -- hammer, typewriter, cash register)	-Develop saleable skills -Preserve stable work force -Meet proven needs for jobs available for military and economic security -Increase earning power for those who can benefit -Use advisory committee from business and industry to identify genuine employment opportunities -Reality in the classroom (e.g., time cards, work orders, OJT) -Concern with placement rates, cancel programs which fail -Teacher technically up-to-date -Little innovation, stay with established occupations -Evaluate on performance on the job	-Percent employed -Percent employed in program-related occupations -Marginal increase in earnings as result of training -Employer satisfaction with quantity and quality of work -Teacher/student ratio -Program cost -Occupational demand for program graduates -Increase in tax revenue from higher wages and productivity.

Table 1 (Continued)
Characteristics of Vocational Education From Various Educational Philosophic Perspectives and Likely Cooresponding Vocational Education Indicators

Philosophic[a] perspective	Key features (symbols)	Noteable characteristics	Likely indicators
Progressivism (Pragmatism)	Problem solver (Light bulb, question mark, lightning, key)	-Self-sufficient economically -Felxible and adaptable to changing needs -Maximize career options, focus on transferable skills -Learning viewed as life long process -Inform students of options and consequences -Experiment with real problems, use laboratories and community -Focus on program clusters -Teacher as guide, knowledgable of changing aspects of work -Evaluate based on coping with vocational problems	-Long term rate of employment -Rate of advancement -Student satisfaction with being able to successfully deal with vocational problems (e.g., finding suitable job, changing work requirements, occupational mobility)
Existentialism	Individual (Contemplating person, voting, me, student, finger print)	-Student accepts repsonsibility for own destiny, can't learn for them -Develop student self-awareness -Student as choosing agent, inner directed -Creative -Student sets own goals, personally responsible for choices -Knowledge is personal -Work is way of knowing self -Traditions, social demands not important -Student awake to themselves and what's going on around them -Student preferences important, attentative to student needs (as defined by them) -Personalized instruction -Evaluation of program from students perspective	-Student satisfaction with program in terms of own needs -Student's feeling of self-management and control in dealing with vocational problems -Number of students self employed

Table 1 (Continued)
Characteristics of Vocational Education From Various Educational Philosophic Perspectives and Likely Cooresponding Vocational Education Indicators

Philosophic[a] perspective	Key features (symbols)	Noteable characteristics	Likely indicators
Behavioral Engineering (Behaviorism)	Engineered (Flowchart, arrow, piece of puzzle, computer card)	-Desire planned, stable society -Students behaviors capable of modification, can be made to fit in (and enjoy it) -Measurable goals and objectives -Scientific testing and evaluation for selection and placement -Match individual and job -Rely on expert, professional to make choices -Goals derived from larger social plans and policy -Focus on "competency based" curriculum -Teacher responsible for materials, content, methods -Evaluate using pre-post, experimental-control designs	-Percent employed in related occupations -Program cost -Employer satisfaction with quality and quantity of work -Occupational demand for program graduates -Viability of alternative sources of training
Reconstructionism	Reformer (Picket sign, broken arrow, sunrise, globe, knight, scale of justice)	-Teach worker rights and responsibilities -Help to see a better future -Lead change, consider what "should be" -Develop spirit of active participation in social change -Develop leadership skills, ability to think critically, to confront -Teacher as socially active, involved in social changes related to work -Use real life situations in teaching -Student has role as change agent	-Student participation in work-related political and social issues -Student feelings of control over work life

[a] Philosophies labeled in parentheses are titles from Minnesota Analysis of Beliefs in Education.

The mission statement should answer the basic question: What is a vocationally educated person? From the minimal analysis conducted here, a mission statement which is abstract may be relatively easy to draft and gain consensus about; however, one which is more useful, especially at time's of crisis, because it is specific and has confronted the basic value differences in predominant educational philosophies held by vocational educators, will require time, serious dialogue and painful choice.

Critical Analysis of a Selected Indicator

That those leaving a vocational education program secure a job has consistently been accepted as an overall aim of vocational education. An additional refinement of this aim is that the job be one which is "related" to the type of training program which the former student left. This additional refinement to the aim of securing a job implies that vocational education programs, at least at some point, are designed to provide training which is specialized to a job or group of jobs. It was not surprising that "number of graduates employed" and "number of graduates employed in occupations related to their training program" were two of the indicators selected as most important to planning, reviewing, and providing public information about vocational education in Minnesota.

When the intent of a vocational program is to provide specialized preparation for a job or group of jobs, then the aim of expecting program leavers to enter these training-related jobs becomes appropriate. The justification being that of efficiency -- presumably if resources are spent by both student and school in preparing the student for a specific job and then the student is either unable or does not want to secure a job of this kind (training-related job), then the resources invested have been wasted to the extent that the specialized training is not used. From an efficiency perspective in this situation, it would have been better for the student to have chosen a different educational program (i.e., one related to the job eventually entered) or not to have entered an educational program at all,

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[1] This section did not benefit from review by the Vocational Education Indicators Work Group. It was done by George Copa as a separate exercise related to a previous MRDC project to illustrate the issues which must be addressed in verifying the appropriateness of a specific indicator.

since the student was evidently able to secure the chosen job without additional, specialized preparation.

Importance of Identifying Training-Related Jobs

When the aim of vocational education is to provide more specialized training for a limited set of jobs or even a specific job as opposed to more general preparation of use in all jobs, then consideration of training-related jobs becomes important. First, in planning the vocational education program, it would then be important to identify the set of jobs for which the program is to provide an education. This delimitation of jobs would be needed in order to design an appropriate curriculum and secure relevant teachers and facilities. Another reason for preidentifying the specific set of jobs for which an education is to be provided is in order to assess if there is a market (labor demand) for persons with this type of an education. Prespecification of the training-related jobs acknowledges which specific jobs should be examined in terms of likely opportunities for employment.

Second, it is important to identify training-related jobs for the purposes of evaluation -- when it becomes necessary to decide if the former student is in fact employed in a training-related job. This evaluative decision is appropriate for the efficiency reason already presented. Presumably the same set of jobs considered to be training-related during the planning phase of a program is appropriate to the evaluation phase.

Purpose of Verification Strategy

The purpose of this verification strategy was to focus on the question, "How should one decide which jobs are related to a training program?" Somehow, this question must be answered directly and consistently before the aim of providing specialized training might be planned or evaluated with any sense of validity. The more specific questions to be addressed in focusing on the above general question are:

- What conceptual framework could provide a useful structure for thinking about the concept of training-related jobs?
- What issues must be resolved in identifying training-related jobs?

Following through on this verification strategy is used to illustrate the categories of issues and process of thinking which should be used with each potential candidate for a vocational education indicator as a part of judging its appropriateness and feasibility. Because the indicator of training-related placement is commonly accepted as important to monitoring vocational education, the implications of this analysis are all the more salient.

A Conceptual Framework For Thinking About Training-Related Jobs

This section provides one way of thinking about the concept of a training-related job. As such, it identifies the major factors or variables important to the consideration of training-relatedness and the relationship among these factors. Much of the perspective provided here is drawn from an earlier report published as part of the Minnesota Research and Development Center for Vocational Education's program of studies dealing with improving the planning of vocational education (Copa, 1981). Without a conceptual framework describing the social phenomen of interest, there is little basis to systematically think about and serve as a basis for evaluating the appropriateness of indicators of the kind sought after here.

Concept of vocational education. Vocational education is posited for the purposes of this analysis as a process....as a means to an end rather than an end in itself. As a process, vocational education is viewed as having its major impact on individuals as opposed to jobs. Individuals serve as the major input to vocational education and are somehow changed while involved with vocational education. The end toward which vocational education is a means is the enhancement of the mutual satisfaction of the individual and society, in general, through the individual's participation in a work role.

Characteristics of individuals changed by vocational education. Individuals can increase their satisfaction in a work role through vocational education by exploring and identifying their needs, improving their ability, changing their geographic location or changing the time at which they will be available for a particular kind of work. Assessment of satisfaction by individuals can take place along these four dimensions before entering a work role (i.e., while in school) or while in a work role and contemplating whether to stay or move to a different work role. Needs refer to the intrinsic and extrinsic motivational wants of an individual which can at least partially be filled by work (i.e., security, authority, creativity). Ability refers to the tasks which an individual can perform or has the aptitude to perform as it relates to the world of work (e.g., make a butt weld, discipline a child, take a soil sample). The same individual will move through different levels of ability related to his/her work role over time. That is, at the pre-school and elementary age, the individual may be just beginning the exploration of tasks relevant to various occupations. Later on in life, the individual will reach higher levels of ability which are prerequisite to a job. Still later, the individual may need to increase his/her ability in a given area, learn abilities in a new area, or simply refresh the abilities he/she once had. Location refers to where the individual is geographically located. Time refers to when the individual is available to participate in vocational education, and eventually, when he/she will be ready to work. These four characteristics of an individual are most relevant when considering the way in which vocational education can change the behavior of an individual relative to his/her work role toward the end of increasing overall mutual satisfaction of individual and society. A fifth, somewhat different characteristic of an individual, but nonetheless relevant to the process of vocational education, is the number of individuals with particular characteristics who are to be served by vocational education.

Characteristics of jobs relevant to vocational education. In order for society to maintain itself and grow (improve) requires certain functions to be accomplished. One of these functions has to do with work in the production of goods and services needed by the society. Society's work functions are made explicit in terms of labor market demand for jobs. The relevant dimensions of these jobs are number of positions, reinforcer patterns, requirements, location and time. Number of positions refers to the number of different work positions (jobs) of various kinds which society makes available in order to accomplish the production, processing and distribution of goods and services desired. Reinforcer patterns refer to the description of a job's potential at fulfilling individual needs (e.g., providing economic security, opportunity to exert authority, potential for using creativity). Requirements describe the tasks needed to satisfactorily perform a given job. Location describes where, geographically, the position is located and time refers to when it is available to be filled. These five characteristics of a job are parallel to the characteristics of an individual most amenable to change by vocational education and thereby provide another part of the basis for planning and evaluating the effect of vocational education.

Conceptual framework for training-relatedness. Combining the five characteristics described in the sections on characteristics of individuals changed by vocational education with the five characteristics of jobs relevant to vocational education results in the framework shown in Figure 2. This framework shows the parallel nature of the characteristics (e.g., needs versus need reinforcers, abilities versus requirements). Assessment of mutual satisfaction of individual and society with the individual's performance in a work role can be made by comparison of the five characteristics at a point in time. It is assumed that increasing compatability of characteristics leads toward increased mutual satisfaction.

Vocational education enters this framework as a process located between the individual and job (work functions of society). Vocational education can also be thought of as mirroring the five relevant characteristics of individuals and jobs as shown in Figure 3. Using this latter framework, training-relatedness of a job can be envisioned as the relationship between the characteristics of the vocational education program and the characteristics of the job. In a sense, this is measure of the responsiveness of the vocational education program to the job (labor market demand).

Another notion stimulated by this framework is a similar relatedness concept which could be envisioned between the characteristics of individuals and the characteristics of the educational program -- a training-relatedness to individuals as opposed to jobs. This concept of relatedness would be especially relevant to the student counseling process before entering and during attending an educational program. The concept describes the potential responsiveness of the educational program to the individuals to be served by the program. Interestingly, a common dilemma in vocational education now becomes readily apparent--whether to be more responsive to job characteristics or individual characteristics when they are in conflict. Correspondingly, when there is high relatedness of eductional program characteristics and job characteristics resulting in societal satisfaction (with employers often as proxy judge) with the program and, at the same time,

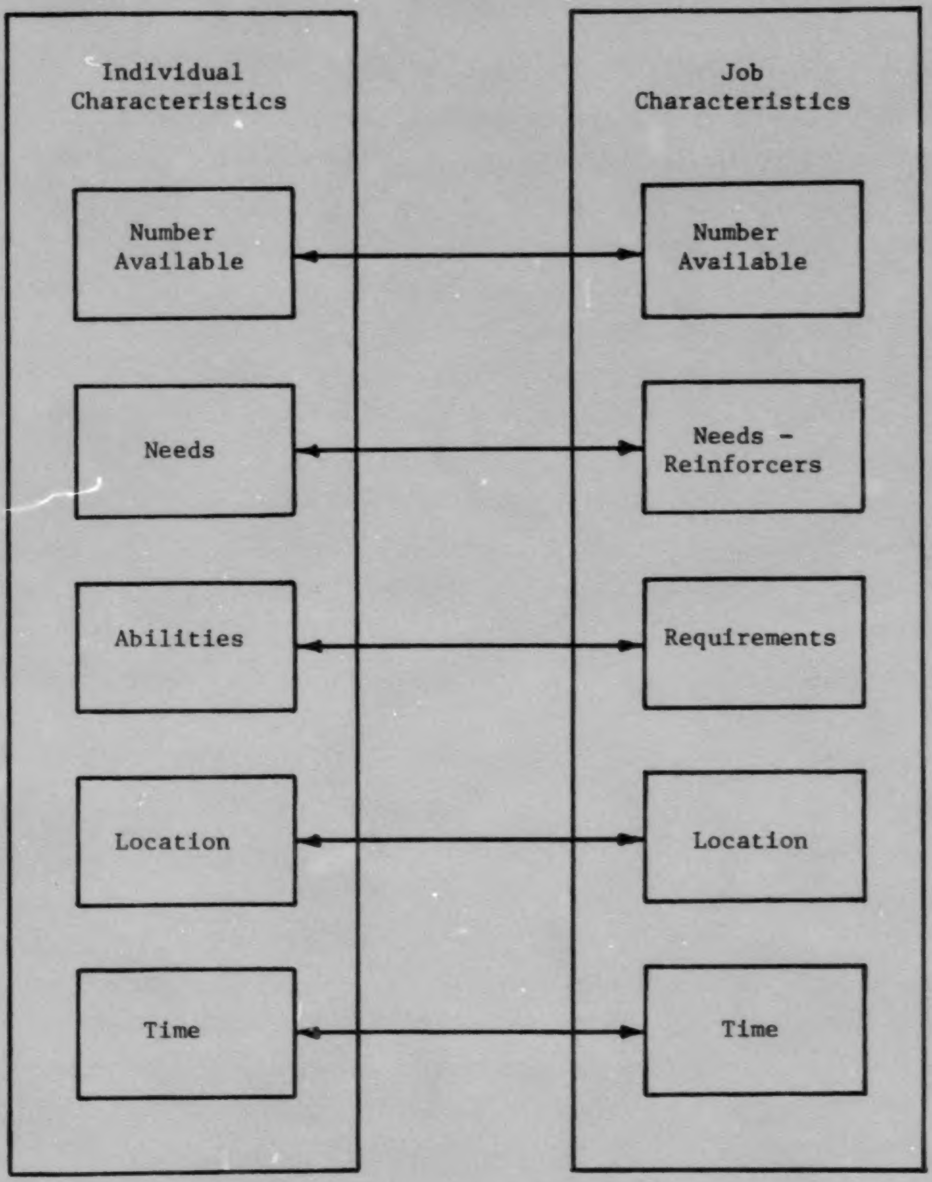

Individual Characteristics
Number Available
Needs
Abilities
Location
Time
Job Characteristics
Number Available
Needs - Reinforcers
Requirements
Location
Time

Figure 2. Relationship of characteristics of individuals changed by vocational education and characteristics of jobs relevant to vocational education.

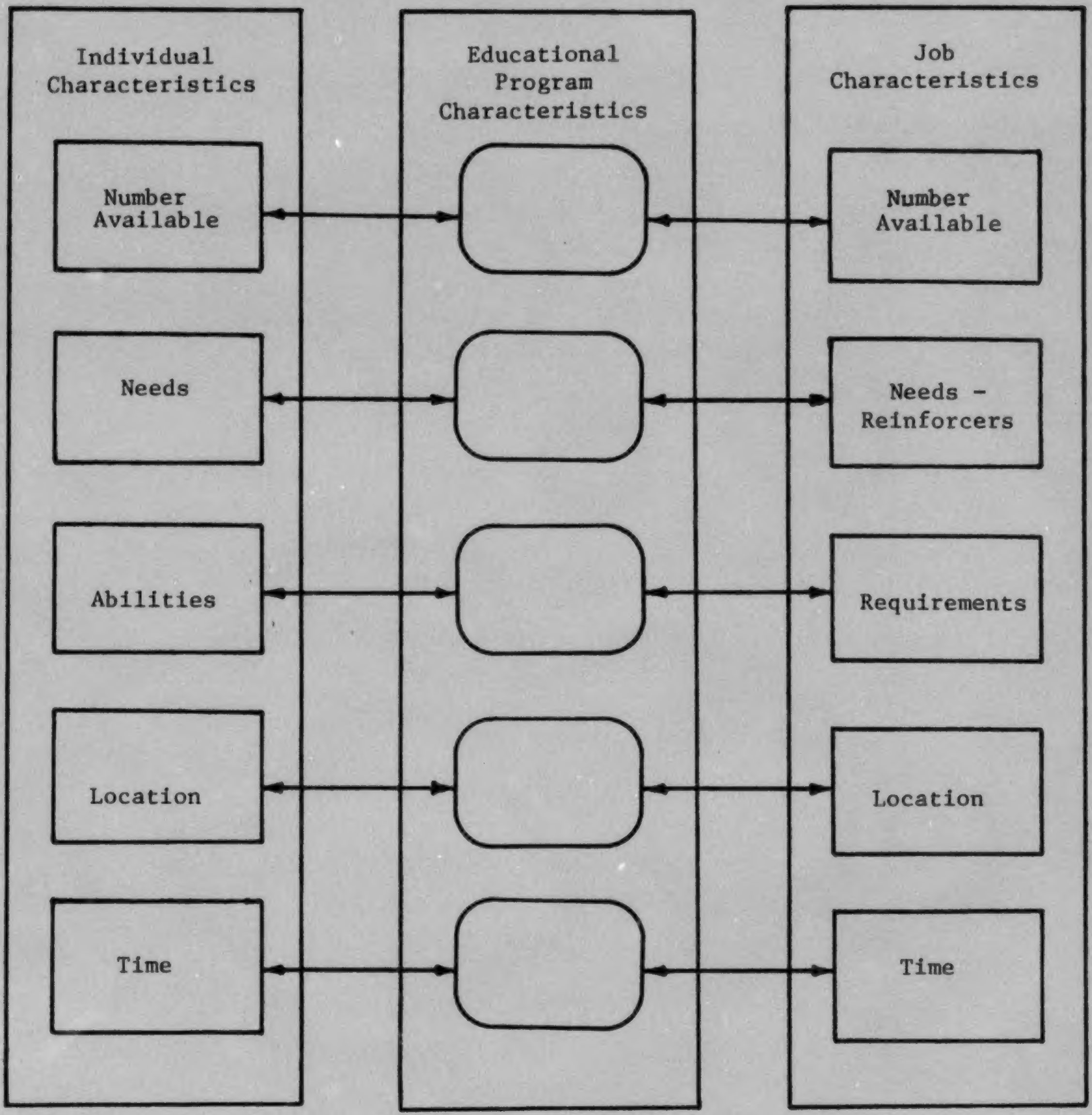

Individual Characteristics
Educational Program Characteristics
Job Characteristics
Number Available
Number Available
Needs
Needs - Reinforcers
Abilities
Requirements
Location
Location
Time
Time

Figure 3. Relationship of vocational education program to characteristics of individuals and characteristics of jobs.

a high relatedness of educational program to individual characteristics resulting in student satisfaction with the program, the desired state of mutual satisfaction exists.

There is one more concept of relatedness which can be derived from the framework shown in Figure 3. This is the relationship between the characteristics of individuals (before, during and after the educational program) and the characteristics of the job when the comparison of characteristics is made before the individual enters the educational program. The contrast in individual and job is usually called a "needs" assessment. The comparison during the educational program is termed a "progress" report or grading. The comparison after the individual has left the educational program is often termed an "evaluation" and usually is accomplished through a follow-up study of students and/or their employers. This latter "evaluation" is often used to assess the effectiveness and efficiency of vocational education -- could the students secure and succeed in training-related jobs? Results of this evaluation can be used to validate previous judgements of what are training-related jobs -- provided the students and labor market cooperate (i.e., the students seek to enter these jobs and the labor market makes employment opportunities in these jobs available).

Critical Issues In Identifying Training-Related Jobs

This section will serve to present a set of critical issues which need to be resolved in defining which jobs are related to a vocational education program. As issues, they have more than one viable answer or response, each with some basis in reason. The issues cannot be ignored in developing and using a procedure to define training-related jobs -- either they must be dealt with directly or are resolved defacto through the procedures selected and the use of resulting information. The issues are divided into three basic categories of questions in terms of their relevance to meanings of "training-related jobs", ends served by using this term and the means used to identify training-related jobs. The issues identified are not exhaustive of all issues relevant to the task of identifying training-related jobs but form an initial list which can be reformulated and added to with more study. An abstract graphical figure will be used to help communicate each of the issues as they are presented for discussion.

Issues concerning the meanings of training-related job. There are many aspects to the term "training-related job". The purpose of this section is not to produce a single sentence definition of training-realted job (i.e., often termed an operational definition) but to describe a more comprehensive picture of just what is being implied when the term "training-related job" is being used in reference to vocational education. The issues concerning meaning are parallel for the vocational education program and the job.

1. Delimination of vocational education program. What is the starting and ending point of the vocational education program to be used in comparing a job in order to determine training-relatedness? Somehow the boundaries of the educational program must be prescribed. Is the educational program made up of one course, a series of courses, a series of independent study modules, and internship? Is the educational program to include only what happens in school? What about on-the-job training obtained before or while attending school or immediately after leaving school? Even within the education received in school, where does the vocational education program start and other education leave off? Just what makes up the vocational education program in question? Is it different for each individual? Each class? Each school? The focus of this issue is shown in Figure 4.

2. Delimitation of job. As with the issue of delimiting a vocational education program, there is a corresponding issue in defining a job. What are the starting and ending points for the activities to be identified as a "job" for the purposes of identifying training-related jobs. Are jobs made up of a series of tasks or duties? If so, what are the common tasks or duties that uniquely go together to make up a particular job? How is the line to be drawn between one job and another? The intent of this issue is depicted in Figure 5.

3. Dimensions of vocational education program description. How is the vocational education program to be described for purposes of determining which jobs are training-related? According to the conceptual framework provided earlier, these dimensions could include the extent to which the program addresses a number of jobs, various kinds which need to be filled, job requirements and job need reinforcers as well as the extent to which the program is sensitive to the time when the jobs will be available to be filled and where these jobs will be located. The potential dimensions of a vocational education program relevant to defining training-related jobs are shown in Figure 6. Are all or selected dimensions to be used?

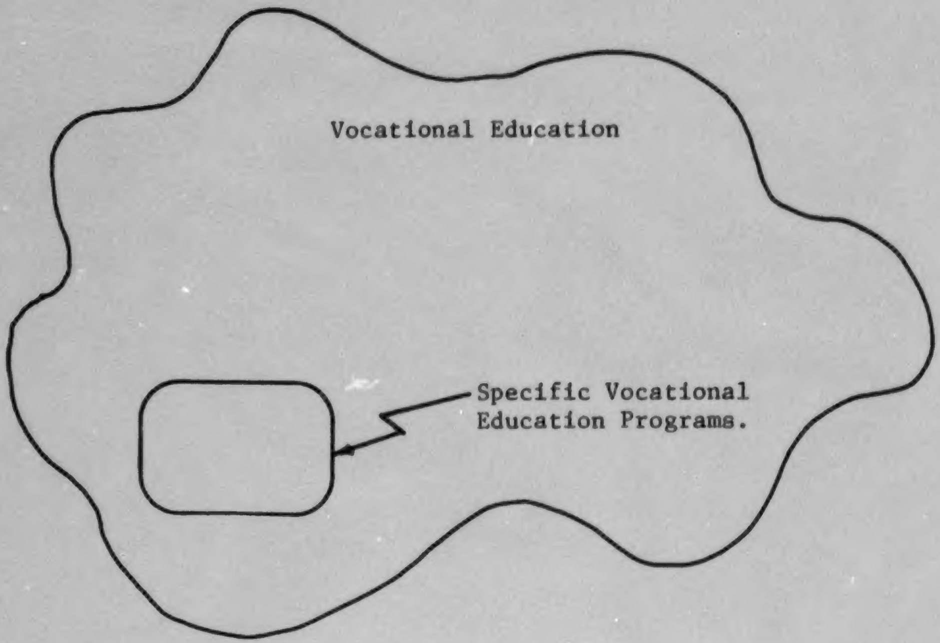

Vocational Education
Specific Vocational Education Programs.

Figure 4. Delimiting the vocational education program.

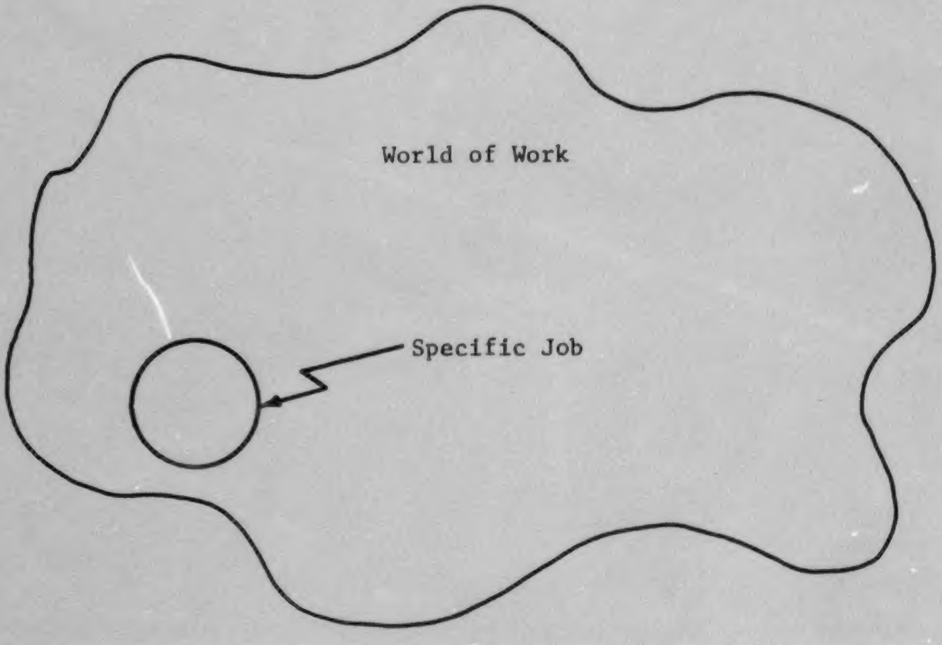

World of Work
Specific Job

Figure 5. Dilimitation of job.

4. Dimensions of job description. And, how is the job to be described? Turning again to the conceptual framework presented earlier, jobs were described along five dimensions pointed out in the previous section on vocational education program description. These dimensions as shown in Figure 7 are number of jobs available, job requirements, job need reinforcers, location of jobs and time of availability. Again, the issue is, "Are all of these dimensions relevant when defining training-related jobs?"

5. Stability of vocational education program description. How should the common knowledge that training programs vary in each of the dimensions of its description from one year to the next, from school to school, from teacher to teacher (even within schools), and from class to class (even for the same teacher) be treated for purposes of defining training-related jobs? These variations go on all the time and may be substantial for programs with the same titles and general description. This issue is complicated by the emergence of individualized vocational programs where the student can "pick and choose" the aspects to be included in their own unique program -- here the notion of standardized vocational education programs almost completely disintegrates. And, how should further discrepancies between what is portrayed in the vocational education program descriptions and what is actually taught and between what is taught and what is actually learned be dealt with in defining training-relatedness? This issue is depicted in Figure 8.

6. Stability of job description. As with the vocational education program description there is also an issue of the stability of a job description. Again there is common knowledge that jobs with the same titles and even general descriptions vary from one type of firm to another, between firms producing the same goods and services from one geographic location or time period within the same firm, and within job positions in the same plant. There may also be a discrepency between the job description and what is actually done on the job. How are these unstable aspects of a job description to be reconciled for the purposes of defining training-related jobs? This issue is presented graphically in Figure 9.

7. Classification of vocational education programs. Given some description of vocational education programs (which is properly delimited and stable), the next issue in pursing meanings is that of classification. Classification becomes useful if there is to be any grouping or aggregation for communication

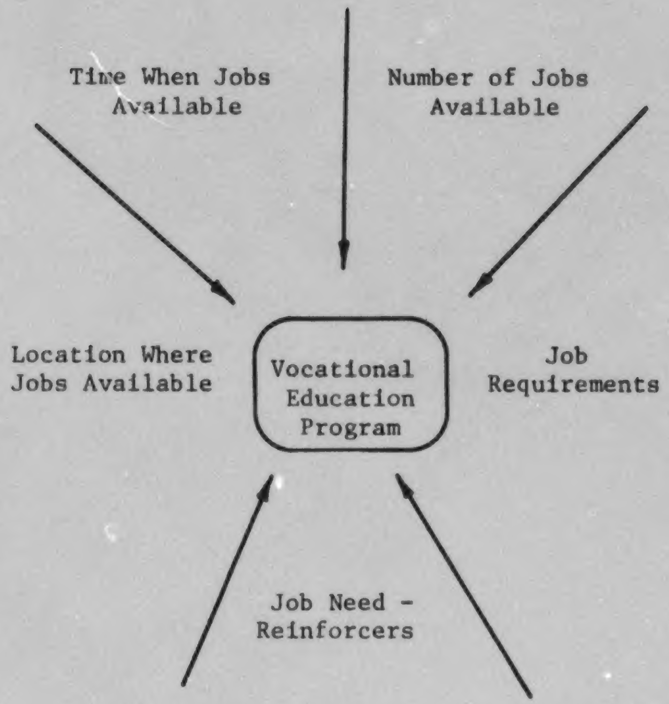

Time When Jobs Available
Number of Jobs Available
Location Where Jobs Available
Vocational Education Program
Job Requirements
Job Need - Reinforcers

Figure 6. Dimensions of vocational education program description.

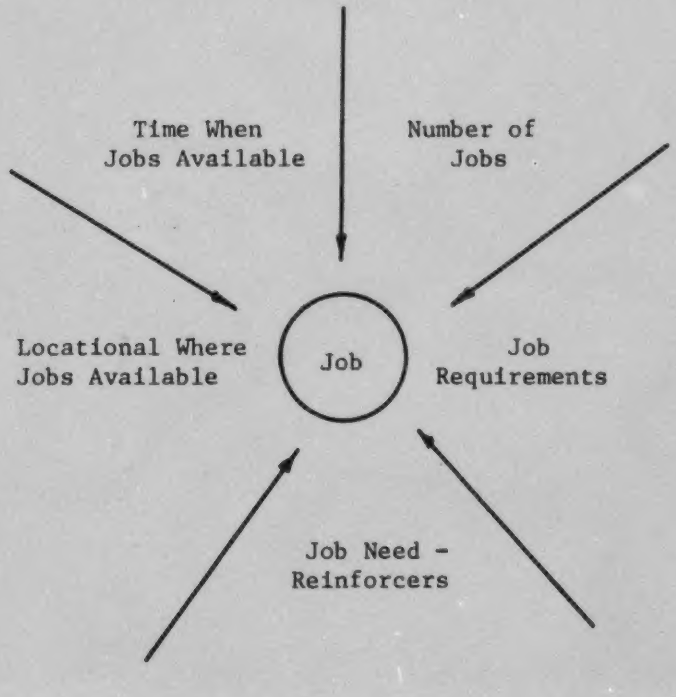

Time When Jobs Available
Number of Jobs
Locational Where Jobs Available
Job
Job Requirements
Job Need - Reinforcers

Figure 7. Dimensions of job description.

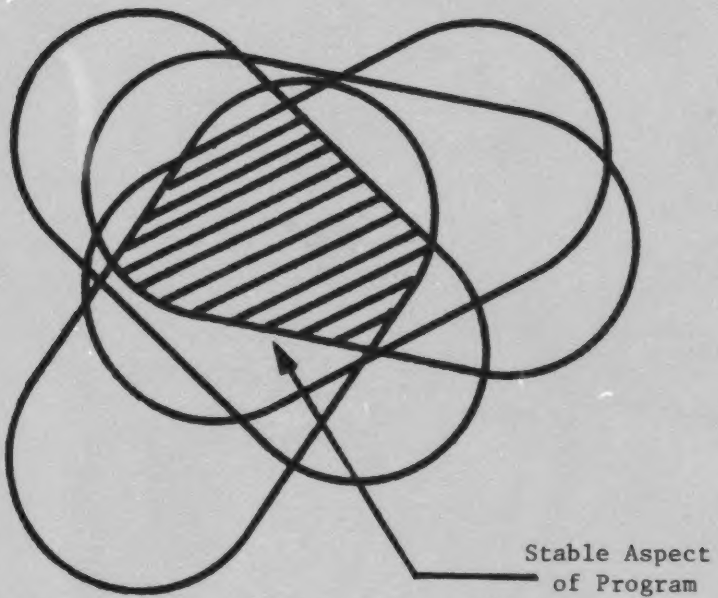

Stable Aspect
of Program

Figure 8. Stability of vocational education program description.

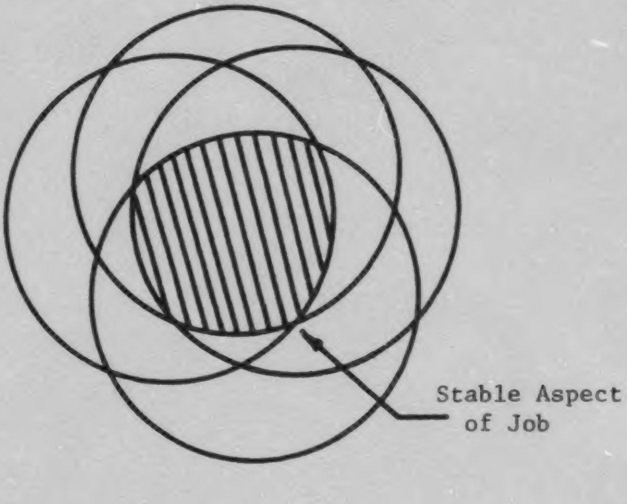

Stable Aspect
of Job

Figure 9. Stability of job description.

purposes (as in planning or evaluating or providing public information); if there is to be grouping, how should it be done for purposes of communicating training-relatedness of jobs? Which dimensions of the program should be used in the classification scheme? How should the categories be labeled? How many categories are necessary? The issue of classification of vocational education programs is shown in Figure 10.

8. Classification of jobs. Classification of jobs is also necessary for aggregation and subsequent communication purposes. How are jobs to be classified for facilitating the valid communication of the training-relatedness of jobs? Should jobs be categorized by occupation (similarity in tasks performed on the job) or industry (similarity in goods and services produced by firms in which jobs are found)? How should the level of job requirements be taken into account? What is an appropriate scheme for classifying jobs by need reinforcers provided, by geographic location, by time when jobs will be available? How are these multiple dimensions of a job description to be combined in a classification scheme? The issue of classification of jobs is shown in Figure 11.

Issues concerning the ends served by using the concept of training-related jobs. Before automatically (without serious thought) accepting the notion of training-related jobs as being relevant to planning and evaluating vocational education program (i.e., the proportion of former students entering training-related jobs), it might be well to consider whose interests are being served by this concept and what values are either being supported or negated in the process. What follows are some of the issues which seem to be relevant to thinking about the ends served by using the idea of training-related jobs in connection with vocational education.

1. Vocational education as specific or general. The very use of the concept of training-related jobs implies that some jobs should be more related than others to a particular vocational education program. In turn, this implies that it is more desirable, at least in some situations, for eductional programs to be specialized rather than providing general preparation which is transferrable to all or at least a large number of different jobs. What are the "situations" where training-relatedness is an important consideration to vocational education and when it is not. For example, a vocational education program with an aim of job orientation or exploration might well consider training-relatedness to a wide variety of jobs in the planning phases but not

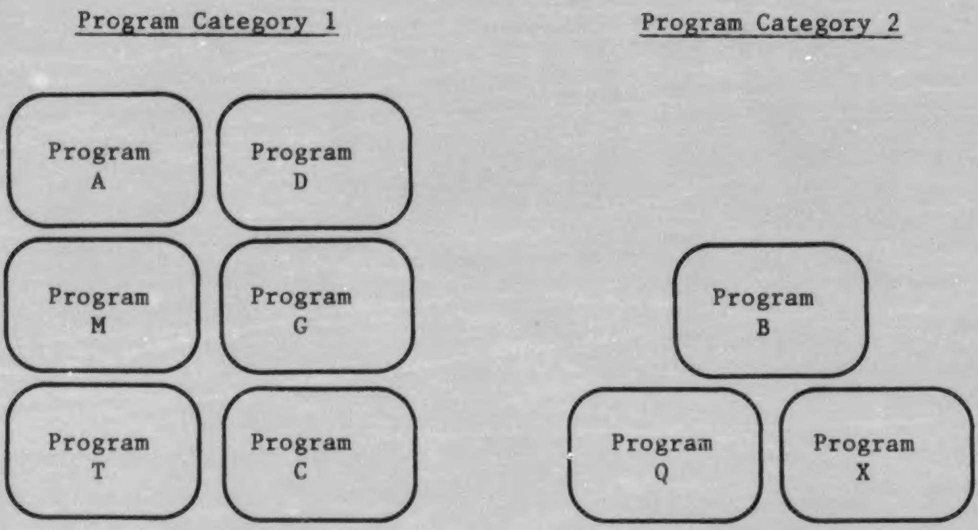

Program Category 1
Program A
Program D
Program M
Program G
Program T
Program C
Program Category 2
Program B
Program Q
Program X

Figure 10. Classification of vocational education programs.

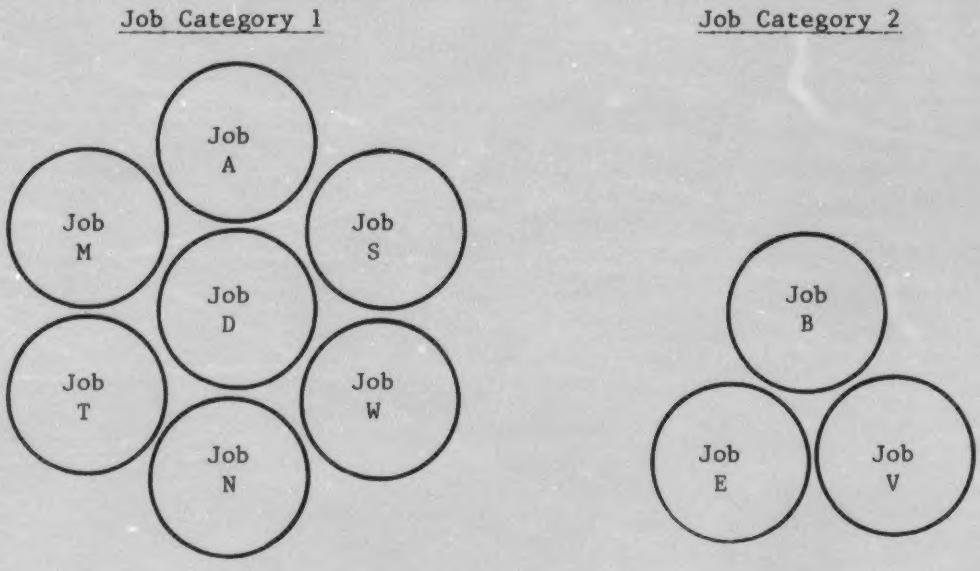

Job Category 1
Job A
Job M
Job S
Job D
Job T
Job W
Job N
Job Category 2
Job B
Job E
Job V

Figure 11. Classification of jobs.

expect students to necessarily enter training-related jobs (because they found during exploration that they did not like or could not qualify for the job). The issue is "If specialization is started in an educational program, where is it to stop?" When is "enough" in the best interests of the student and the larger society? Is a separate education program needed for each job, however jobs are described? If not, to what extent should jobs be grouped or clustered toward achieving the ends desired of vocational education? An extension of this issue is to question the degree to which it is desirable for learning in vocational education to transfer to other life roles outside of the work role. The answer to these questions will necessitate the taking of a reasoned position on the ends to be served or the mission of vocational education. One position on this mission was presented earlier in this section and described in terms of increasing the mutual satisfaction of individual and society as it relates to the work function. The issue of specific versus general education for vocational education is graphically illustrated in Figure 12.

2. Value of job. In the conceptual framework presented earlier, a job's description is assumed to be a direct description of a function that society, in general, considers acceptable and wishes to have done and is therefore willing to reward. Society is a convenient abstraction set up for the purpose of discussing the interests of all individuals taken collectively. Vocational education is a form of education conceived by these individuals. Might it not be part of the role of vocational education to raise questions about the desirability of some jobs as the basis for an educational program (from the interests of these same individuals taken collectively and the values they share about what constitutes the "good life"). Some jobs or even aspects of many jobs may be degrading to individuals because of working conditions, the nature of tasks to be done, or the equity of the rewards for doing the job. Or at least, it may not pay to invest time by student or school in preparing for some jobs through a formal educational program because there is no margin of benefit to specialized education in terms such as pay or opportunity to get the jobs. The issue relating to the value of the job is shown in Figure 13.

3. Job description as an accurate portrayal of societal needs. The issue here is whether or not the job description as it is finally communicated to the educational program and potential job holders is authentic in terms of

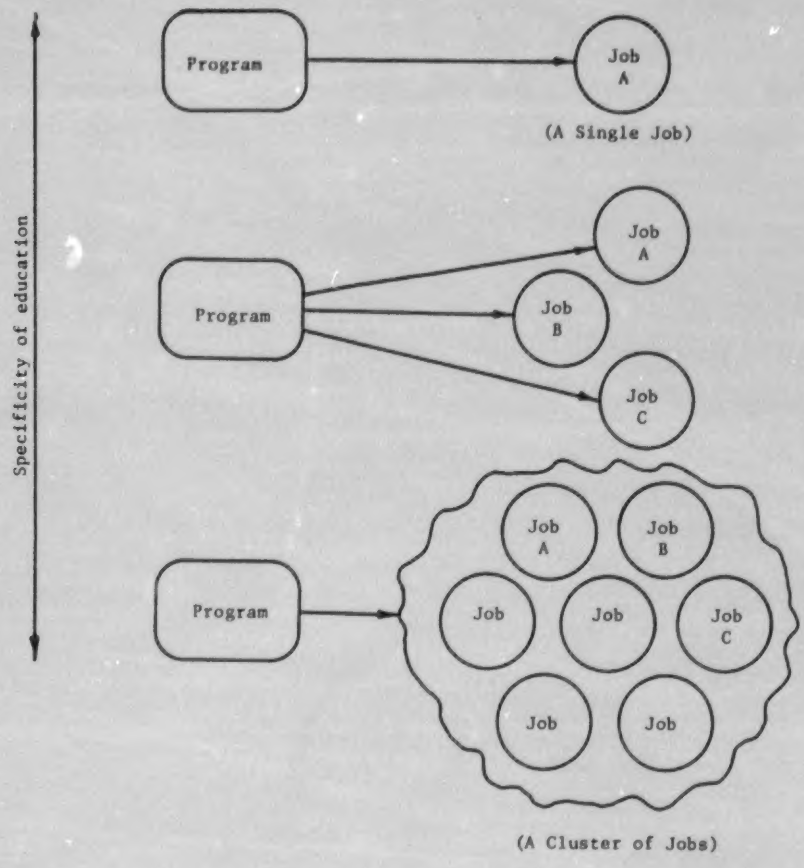

Specificity of education
Program
Job A
(A Single Job)
Program
Job A
Job B
Job C
Program
Job A
Job B
Job
Job
Job C
Job
Job
(A Cluster of Jobs)

Figure 12. Vocational education versus specific or general education.

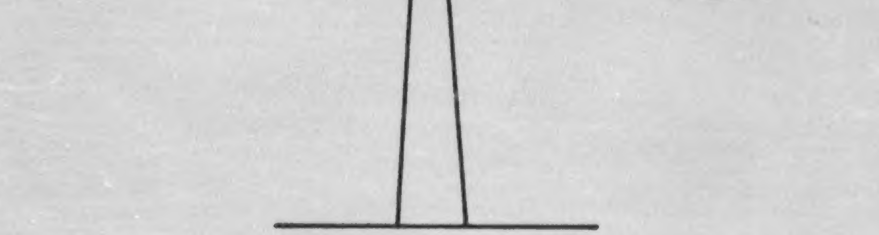

Job
Societal Values

Figure 13. Value of jobs versus justification for educational program.

societal needs. Or, have societal wishes somehow been thwarted by employers, thereby resulting in exploitation of employees. This issue is shown as Figure 14.

4. Program responsiveness to individual and job. How responsive should the vocational education program be to the job? Does this responsiveness come at the expense of being responsive to potential students? Might not too much emphasis on identifying training-related jobs in the planning and evaluation of vocational education programs "tip the scale" in the favor of the job? But then perhaps the emphasis is necessary if the ultimate criteria for vocational education is that the student be able to get a training-related job. Who should be considered most adaptable in the labor market -- individual (potential job seeker), or employer (job description), or the vocational education program? Who should change? Does it always have to be the individual? Too great an emphasis on a static "matching mentality" (of individual, program and job) may allow vocational education to easily fall into the stance that the job description is fixed and that the educational program and individual are the aspects which most need to change (adapt to the environment). However, it may well be that from an equity of opportunity or justice perspective, it is the job description or hiring practices which need to be adapted to better fit the individual. If the public schools are to play a major role in social reform as well as inculcation, then the job description cannot always serve as the boundaries or parameters for an educational program. The issue of balance in responsiveness for the vocational education program between individual and job is presented in Figure 15.

Issues concerning the procedure or means for identifying training-relatedness. Given consideration to the meaning held for training-related jobs and the desired ends for vocational education (and how these can be facilitated through using the concept of training-related job) then it is in order to think about the procedures or means for identifying training-related jobs. The issues presented in this section deal more specifically with the technical aspects of the problem of relating vocational education to jobs.

1. Start with vocational education or job. In trying to identify jobs related to a given vocational education program, should the process be started by first measuring the educational program or job? Depending on where the process is initiated, the results may well be different. Starting

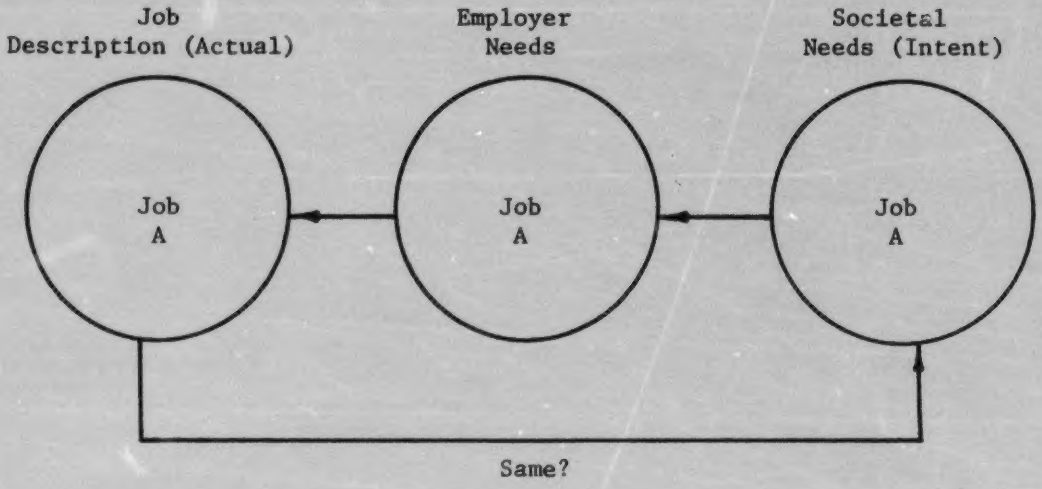

Job
Description (Actual)
Employer
Needs
Societal
Needs (Intent)
Job
A
Job
A
Job
A
Same?

Figure 14. Job description versus an accurate protrayal on intended social needs.

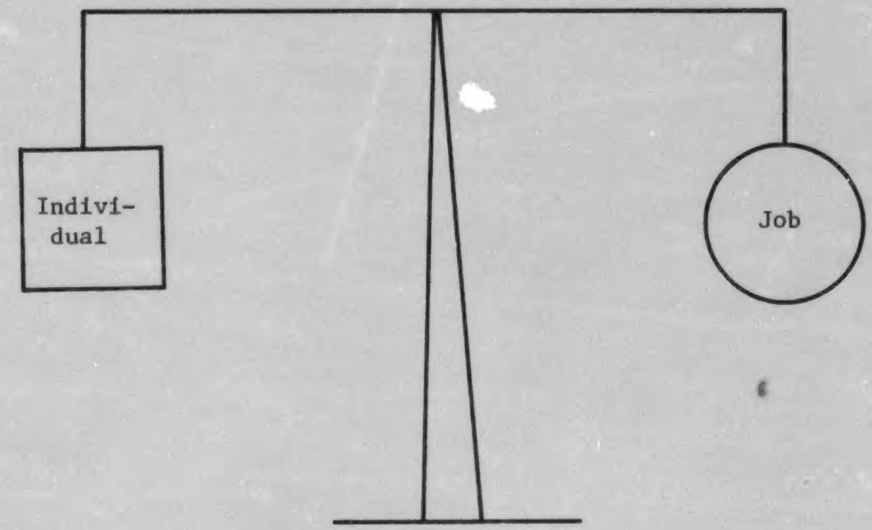

Individual
Job

Figure 15. Vocational education program responsiveness to characteristics of individuals and job.

with the educational program, one is likely to find several jobs related to the educational program which vary in degree of relatedness from very close to not very much. Also starting with the educational program will likely mean using a set of learning objectives as a basis or scale for measuring relatedness (i.e., Is knowing these learning objectives of benefit in performing the job?). Alternatively by starting with a job, one is likely to find several related vocational education programs, some of which relate very closely and some which provide only partial preparation for the job. Also, in starting from a job perspective, one is likely to start with a lot of tasks performed on the job or needs-reinforcers describing the job and to use these lists in examining vocational education programs. The list of learning objectives and the list of tasks may be quite different in their content and organization. The issue of starting with vocational education program or job is shown in Figure 16.

2. How much is enough to call "related". In examining the relationship between an educational program and jobs, just when is there enough evidence to classify the program and job as being related? The degree of relatedness might be thought of on a scale (continuum) from zero (no relation) to one (perfect relation). Where along this scale should the line be drawn between what will be called related and unrelated jobs? Might the line be drawn in different places for different purposes? How precisely does relatedness have to be communicated -- two categories, five categories, one hundred categories? The use of "how much is enough" to be called related is depicted in Figure 17.

3. Common denominator for vocational education program and job. The most difficult question in the process of identifying training-related jobs is the working out of a way to translate the descriptions of vocational education programs and jobs. Should the language of the educational program or job description be used or is there yet another language which would be more useful as a common denominator of program and job? Even with an agreed upon language for the dimension of "abilities/requirements" such as using tasks, one faces the issues of level of training on the task (e.g., familiar with, can supervise others) and importance of task (e.g., frequency of use, proportion of time). The issue of a common denominator is shown in Figure 18.

4. Collecting information on training-relatedness. How does one find out

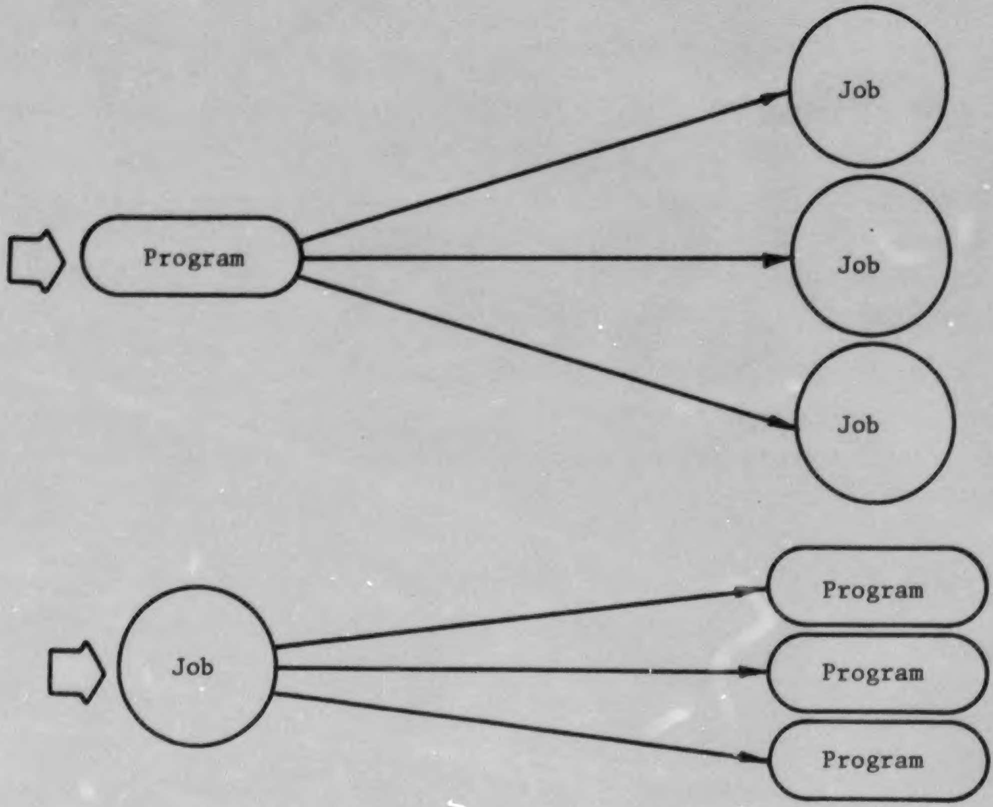

Program
Job
Job
Job
Job
Program
Program
Program

Figure 16. Starting with vocational education program or with job.

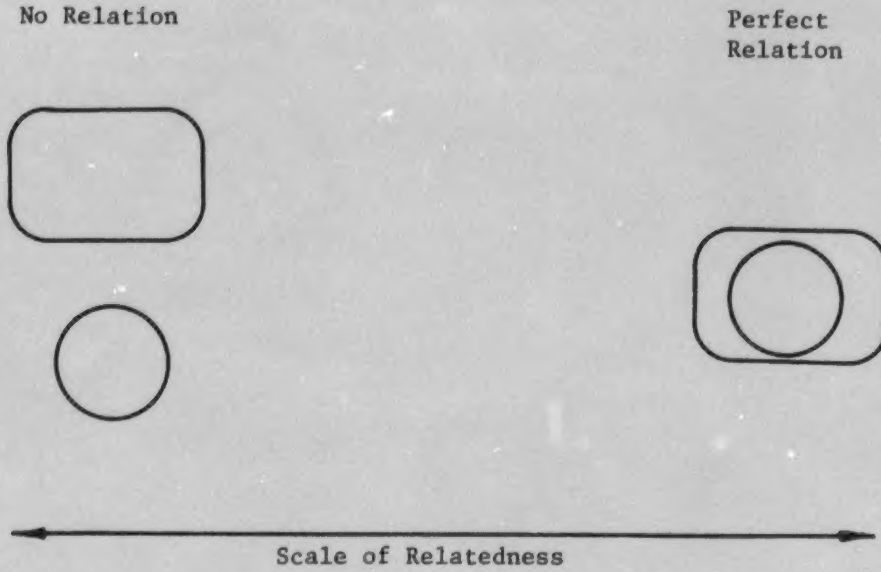

No Relation
Perfect Relation
Scale of Relatedness

Figure 17. How much relationship is enough to be training-related.

exactly what is taught in a vocational education program and exactly what are the characteristics of a job? Do you analyze course outlines and job descriptions, observe classes and job performance, or interview teachers, students, and administrators and employees and employers? Do you use a checklist, questionnaire, unstructured interview schedule? How do you validate and check reliability of your information? Besides how and from whom you collect information concerning relatedness, when should the information be collected? Before the vocational education program starts? Periodically thereafter? If for evaluation purposes you need information on the proportion of students entering training-related jobs, do you focus on the first job entered, first two jobs, jobs held in first two years, or entire career (perhaps depends on entry versus advancement emphasis to program)? In this instance, how do you deal with the situation where the student is qualified for training-related jobs but for some reason choses not to enter these jobs. The issue of collecting training-relatedness information is presented in Figure 19.

Discussion

As should now be apparent, a good deal of reflection might be in order before uttering the words "training-related job" in a research study or evaluation report pertaining to vocational education let alone using them to describe an important vocational education indicator. A similar process of identifying issues might well be done with several other concepts commonly used, seemingly unconsciously, in potential vocational education indicators (e.g., special needs students, equality of educational opportunity, job satisfaction, vocational). While resolution of these issues is an idealized end point, of more importance is that the issues be continuously raised and openly discussed by the parties affected. The reasoning is that any resolution is likely to be specific to a time and place and group of individuals -- as such, it is at best temporary and partial; what remains important is to continue dialogue. Also apparent from the analysis of the concept of training-related jobs is the categories of issues which need to be addressed in verifying specific vocational education indicators. These categories concern the meaning of key words used in stating the indicator, the justification of the values or ends

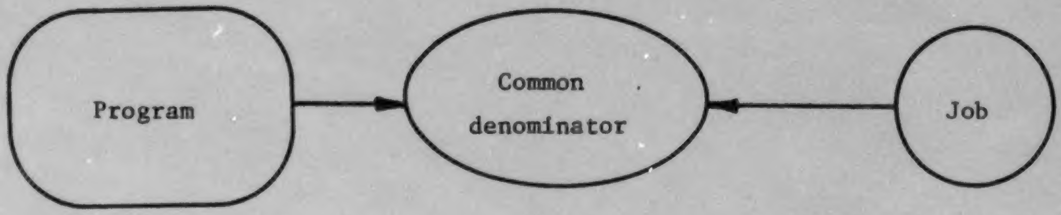

Program
Common denominator
Job

Figure 18. Common denominator for vocational education program and job.

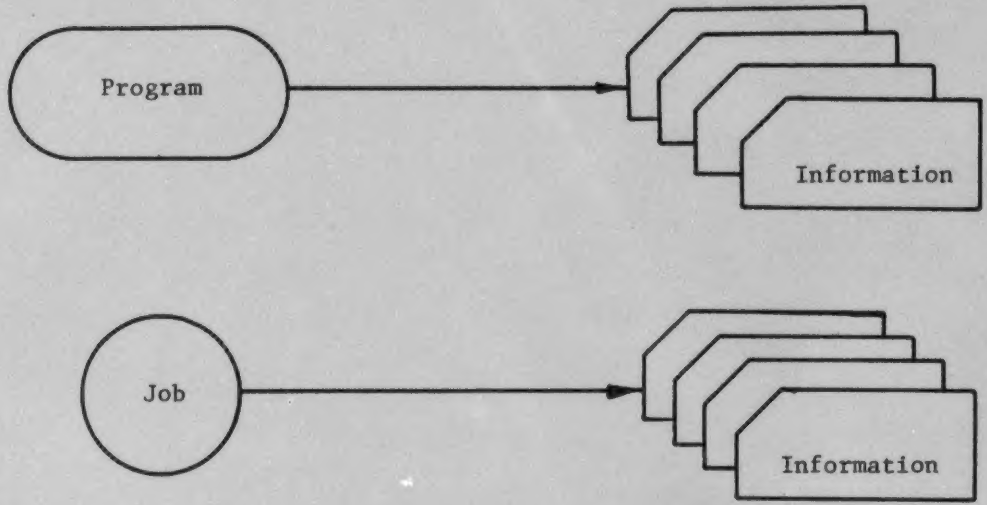

Program
Information
Job
Information

Figure 19. Collecting information on training-relatedness.

implied by the indicator and selecting appropriate means to measure or operationalize the indicator. In stating specific issues within each of these categories as a basis for discussion, the necessity of a conceptual framework is highlighted. As was illustrated, this framework serves to provide a way of thinking about the issues and a language with which to communication to others. This is accomplished by the framework in its identification of key sub-concepts (the objects and boudaries of discussion) and their interrelationship; as such, it serves to give both context and focus to issue discussion. From applying the idea of categories of issues and a conceptual framework to the concept of training-related job, the shere complexity and seriousness in consequences of indicator verification is evident. It appears a process which ought not be avoided yet will never be completed.

Summary

This chapter has served to describe efforts at further verification of vocational education indicators as to their appropriateness in planning, reviewing and providing public information about vocational education in Minnesota. The strategies used were only a sub-sample of those initially suggested and discussed by the Work Group which provided direction to this project. However, the strategies which were carried through do represent quite different ways to probe the appropriateness of potential indicators.

In looking across the three types of analyses conducted, the following summary points seem justified:

- A mission statement for vocational education in Minnesota which is specific and address major value conflicts is essential to indicator verification.
- A conceptual framework for vocational education which is consistent with the mission statement is necessary to provide a way of thinking and language (key concepts) with which to discuss indicator verification.
- Indicator verification must address questions of the meaning of concepts used, the ends implied and means of operationalizing the indicators selected for use.

- Indicators selected for general purposes in monitoring vocational education may need to be supplemented by indicators which are specific to particular purposes.
- The process of indicator verification must be continuous if indicators are to remain relevant to changing social conditions and technology.

CHAPTER III.
FURTHER DEVELOPMENT OF INDICATORS WITH ADEQUATE DATA

Four of the proposed vocational education indicators appeared to have adequate data available to warrant continued development. This development involved deciding upon appropriate operational definitions of each indicator and displaying the indicator in a clear and useful format. The four indicators for which these steps were implemented include:

- Number of Graduates Employed;
- Number of Graduates Employed in Occupations Related to Program;
- Employer's Satisfaction with the Quality of the Graduate's Work; and,
- Program Cost.

In the following sections criteria for appropriate operational definitions will be suggested and operational definitions for each of the indicators will be proposed. Existing data from the Minnesota Vocational Follow-Up System and the Post Secondary Vocational Program Budget/Financial Report will be used for these operational definitions. For each indicator, an operational definition will be proposed, followed by an exhibit of the source and presentation of its data as it occurs in either the follow-up or budget report. Following will be an analysis of the ability of each indicator's operational definition to adhere to the criteria suggested for an appropriate operational definition. Additional sections of this chapter deal with setting benchmarks for indicators and deriving composite measures of two or more indicators.

Operational Definition of Indicators

In order that the nature of operational definitions be described more specifically, a set of criteria delinating "good" operational definitions was developed. These criteria were used to guide the development of the operational definitions, to evaluate their completeness and worth, and to assure their accurate interpretation.

Criteria for Operational Definitions

Criteria for the operational definitions should reflect an overall purpose of facilitating clear, coherent communication. Operational definitions should be more specific and require less effort in explaining the meaning of an indicator than is provided by just the title or statement of the indicator itself. At the same time, operational definitions must describe the essence or important characteristics of indicators, assuming that the indicators have discoverable and describable characteristics. Aware of these purposes, the following criteria were suggested:

- Be a measurable characteristic of the indicator (Kerlinger, 1966; Ebel, 1972);
- Cover or encompass the essence of the indicator (Ebel, 1972; Reynolds, 1975);
- Communicate a more specific and clear understanding (Kerlinger, 1966; Ghiselli, 1964; Van Dalen, 1979);
- Describe the operations necessary to make the specified measurement (Kerlinger, 1966; Ghiselli, 1964; Sellitz, Jahoda, Deutsch, & Cook, 1966);
- Be manipulable arithmatically to enable summarizing the measure (Ghiselli, 1964);
- Be feasible in terms of data availability, expertise required to derive, and cost; and
- Give consistent measures for different times, investigators and places (Sellitz, et al., 1966; Van Dalen 1979).

Using these criteria as a guide the following operational definitions for the four indicators were developed.

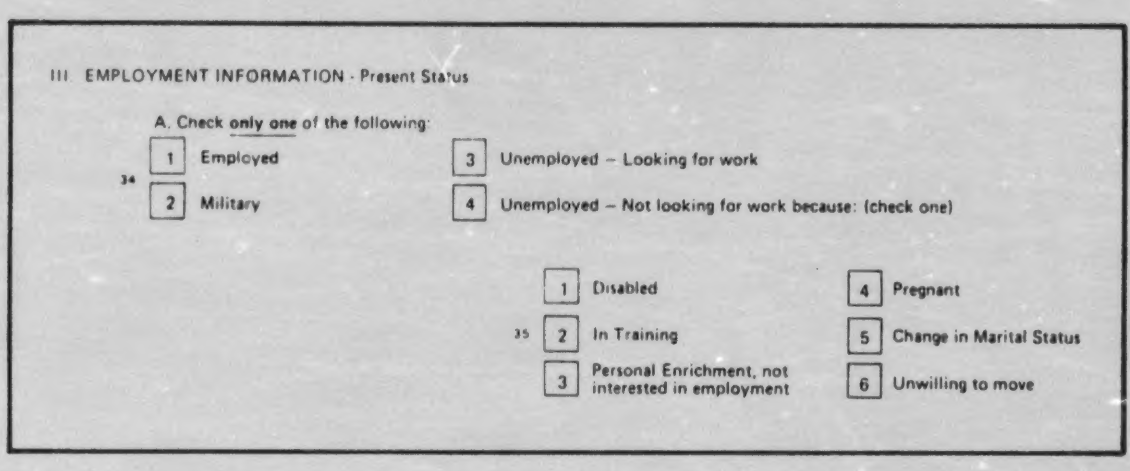
Indicator: Number of Graduates Employed

Proposed operational definition. Percent of graduates responding to the Student Follow-Up Questionnaire and indicating that they are presently employed by completing Section III, Employment Information - Present Status, of the Student Follow-Up.

Source of data. The data are derived from the Job Information section of the Follow-Up Questionnaire completed by the graduate. Exhibit 2 is a replication of that section in the questionnaire.

Exhibit 2

Employment Information Section of the Statewide Follow-Up Questionnaire



III. EMPLOYMENT INFORMATION - Present Status

A. Check only one of the following:

34
☐ 1 Employed
☐ 2 Military
☐ 3 Unemployed – Looking for work
☐ 4 Unemployed – Not looking for work because: (check one)

35
☐ 1 Disabled
☐ 2 In Training
☐ 3 Personal Enrichment, not interested in employment
☐ 4 Pregnant
☐ 5 Change in Marital Status
☐ 6 Unwilling to move

Report of data. The data is reported in Table 2 of the 1981 Follow-Up Report. As described in the report, Table 2:

> shows (1) how many of the graduates included in this report were employed one year after graduation, (2) how many of the graduates were employed at some time during the year but not at the time when the follow-up was conducted one year after graduation, and (3) how many people were not employed at any time during the year. This group includes people who were unavailable for employment throughout the year as well as those who were unemployed. It is possible to determine the total number of people who were employed at some time during the first year after graduation.

Indicator: Number of Graduates Employed in Occupations Related to Program

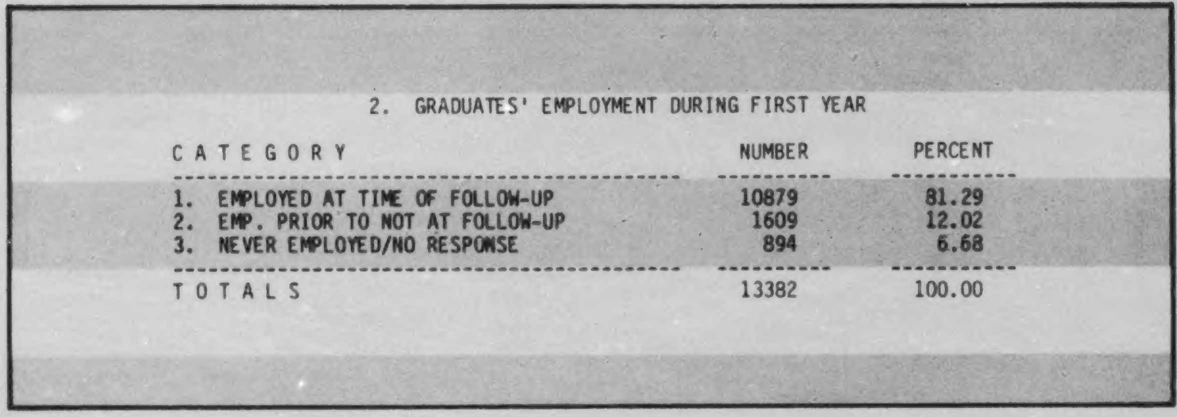
Proposed operational definition. Percentage of graduates responding to the Follow-Up Questionnaire and classified in Category 1 or Category 2 of Table 3 of the Statewide Follow-Up Report.

Source of data. The relatedness of the employment of graduates is determined by Educational Management Services (EMS), the company conducting the postsecondary follow-up study. EMS clerical staff members assign to each graduate's occupation, at the time of the follow-up, a Department of Education (DE) code number, considering the graduate's and employer's

Exhibit 3 is a copy of Table 2 of the 1981 Follow-Up Report.

Exhibit 3

Table 2 of the 1981 Statewide Follow-Up Report: Graduates Employment During First Year



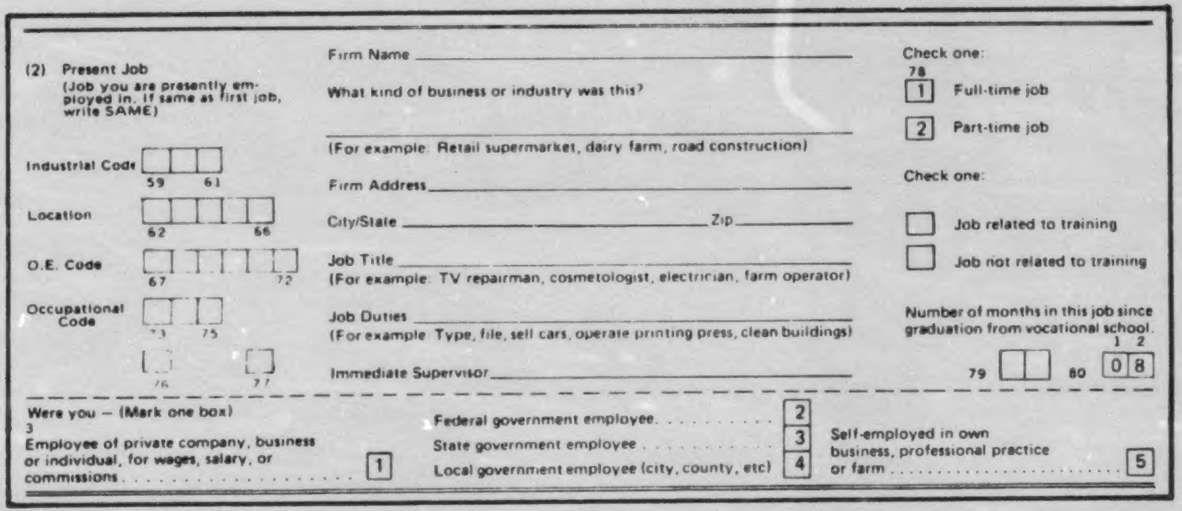
2. GRADUATES' EMPLOYMENT DURING FIRST YEAR

CATEGORY	NUMBER	PERCENT
1. EMPLOYED AT TIME OF FOLLOW-UP	10879	81.29
2. EMP. PRIOR TO NOT AT FOLLOW-UP	1609	12.02
3. NEVER EMPLOYED/NO RESPONSE	894	6.68
TOTALS	13382	100.00

descriptions of the job held by the graduate. The graduate's description of his/her present employment is from Section IV, Part (2) of the Follow-Up Questionnaire and the employer's description of the graduate's job is a response to three questions at the end of the Employer Questionnaire. These sections are shown in Exhibit 4 and Exhibit 5.

Exhibit 4

Job Description Item on the Follow-Up Questionnaire of the Statewide Follow-Up System



(2) Present Job
(Job you are presently employed in. If same as first job, write SAME)

Industrial Code ☐☐☐ 59 61
Location ☐☐☐☐☐ 62 66
O.E. Code ☐☐☐☐☐☐ 67 72
Occupational Code ☐☐☐ 73 75
☐ 76 ☐ 77

Firm Name ______________________
What kind of business or industry was this? ______________________
(For example: Retail supermarket, dairy farm, road construction)
Firm Address ______________________
City/State ______________________ Zip __________
Job Title ______________________
(For example: TV repairman, cosmetologist, electrician, farm operator)
Job Duties ______________________
(For example: Type, file, sell cars, operate printing press, clean buildings)
Immediate Supervisor ______________________

Check one:
78
1 Full-time job
2 Part-time job

Check one:
☐ Job related to training
☐ Job not related to training

Number of months in this job since graduation from vocational school.
79 ☐☐ 80 0 8 (1 2)

Were you — (Mark one box)
3
Employee of private company, business or individual, for wages, salary, or commissions 1
Federal government employee. 2
State government employee 3
Local government employee (city, county, etc) 4
Self-employed in own business, professional practice or farm 5

Exhibit 5

Job Description Question on the Employer Questionnaire of the Statewide Follow-Up System

Job Title ____
(For example: TV repairman, cosmetologist, electrician, farm operator)

Job Duties ____
(For example: Types, files, sells cars, operates printing press, cleans buildings)

What kind of business or industry is this?
____
(For example: Retail supermarket, dairy farm, road construction)

Report of data. The data for Exhibit 4 and Exhibit 5 are tabulated and presented in Table 3 of the 1981 Statewide Follow-Up Report (See Exhibit 6). As described in the report, Table 3:

> Indicates the employment status of graduates one year after graduation. The information is broken down into seven categories: (1) the number of graduates employed in closely related occupations (they entered the exact occupations for which trained); (2) the number of graduates employed in broadly related occupations (they were employed in occupations somewhat related to the curriculum areas from which they graduated but not in the exact occupation for which trained); (3) the number of graduates employed in unrelated occupations (they were employed but in occupations unrelated to the curriculum areas from which they graduated); (4) the number of graduates employed, but for whom no present job information was available (no determination possible); (5) the number of graduates in the military; (6) the number of graduates unavailable for employment (they had reasons, as documented in Table 4, for being unavailable for employment); and, (7) the number of graduates unemployed (they did not have jobs but were actively looking for jobs).

Indicator: Employer Satisfaction with the Quality of Graduate's Work

Proposed operational definition. Percentage of employers rating graduates employed in related occupations in the top half of their work group, indicated by checking response 1 or 2 of Section IV of the Employer Questionnaire of the Statewide Follow-Up System.

Exhibit 6

Table 3 of the 1981 Statewide Follow-Up Report: Employment Status One Year After Graduation

3. EMPLOYMENT STATUS ONE YEAR AFTER GRADUATION - EMPLOYED, UNEMPLOYED, OR UNAVAILABLE

CATEGORY	NUMBER	PERCENT
1. EMPLOYED CLOSELY RELATED	7414	55.85
2. EMPLOYED BROADLY RELATED	1104	8.31
3. EMPLOYED UNRELATED	1834	13.81
4. EMPLOYED - NO PRESENT JOB INFO	488	3.67
5. MILITARY	39	0.29
6. UNAVAILABLE FOR EMPLOYED	771	5.80
7. UNEMPLOYED	1623	12.22
NO RESPONSE	109	**
TOTALS	13382	100.00

Source of data. The data is taken from responses to the questions of Section IV of the Employer Questionnaire as displayed in Exhibit 7 below.

Exhibit 7

Employer Satisfaction Questions on the Employer Questionnaire of the Statewide Follow-Up System

IV In comparison with other workers in the same work group, how would you rate the employee's over-all competency, effectiveness, proficiency, general over all work attitudes, and other elements of successful job performance?

1 In the Top ¼

2 In the top ½ but not among the top ¼ (38)

3 In the bottom ½ but not among the lowest ¼

4 In the lowest ¼

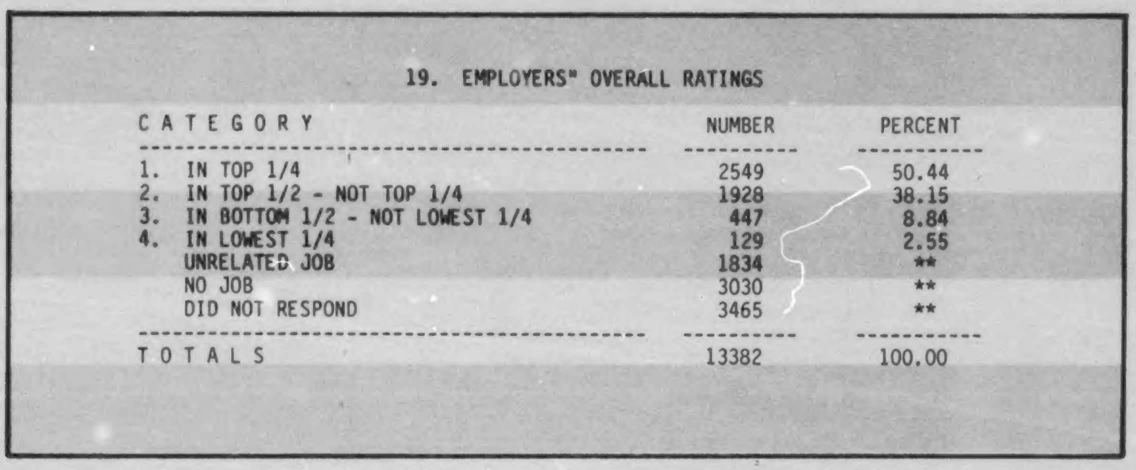
Report of data. The data indicating the extent of employer satisfaction of graduates working in related occupations are found in Table 19 of the 1981 Statewide Follow-Up Study Report. Table 19 shows:

> the number of graduates whose employers rated them: (1) in the top 1/4, (2) in the top 1/2 but not the top 1/4, (3) in the bottom 1/2 but not the lowest 1/4, and (4) in the lowest 1/4 categories compared with other workers in their work groups. Also indicated are the number who were unemployed, did not respond, or were employed in unrelated jobs. The aspects judged were competency, effectiveness, proficiency, general overall work attitudes and other elements of successful job performance.

These data are displayed in Exhibit 8 below.

Exhibit 8

Table 19 of the 1981 Statewide
Follow-Up Report: Employer's Overall Ratings



19. EMPLOYERS" OVERALL RATINGS

CATEGORY	NUMBER	PERCENT
1. IN TOP 1/4	2549	50.44
2. IN TOP 1/2 - NOT TOP 1/4	1928	38.15
3. IN BOTTOM 1/2 - NOT LOWEST 1/4	447	8.84
4. IN LOWEST 1/4	129	2.55
UNRELATED JOB	1834	**
NO JOB	3030	**
DID NOT RESPOND	3465	**
TOTALS	13382	100.00

Indicator: Program Cost

Proposed operational definition. Instructional cost per average daily membership (ADM). Instructional cost is composed of licensed and non-licensed teacher salaries and fringe benefits, profesisonal/administrative travel and purchased services.

Source of data. The data for this indicator comes from the financial records kept by each school district and reported to the State Department of Education.

Report of data. The raw data are reported in the Post-Secondary Vocational Program Budget/Financial Report (PVPBFR). Exhibit 9 is an example of this data.

Exhibit 9

Example of Cost Data From The Post-Secondary Vocational Program Budget/Financial Report

LICENSED SALARIES /ADM	NON-LIC SALARIES /ADM	LICENSED FRG BENF /ADM	NON-LIC FRG BENF /ADM	TRAVEL. INST-ADM /ADM	TRAVEL. PROF DEV /ADM	OTHER PUR SERVICES /ADM	OTHER EXPENSE /ADM
706.3	.0	30.4	.0	16.3	7.9	1.3	15.3
1514.8	.0	89.6	.0	35.9	.0	9.8	34.8
1978.7	.0	145.8	.0	53.8	.0	28.8	.0
1196.5	.0	48.6	.0	16.9	6.3	11.0	22.9
919.2	62.4	46.0	10.2	17.4	5.8	109.7	22.3
1032.9	.0	98.8	.0	33.9	1.3	56.9	4.3
1127.4	.0	10.8	.0	.0	2.4	20.5	18.3
1667.0	.0	38.4	.0	.0	8.9	67.1	7.9
1209.4	.0	21.6	.0	17.0	7.7	23.0	5.9
2002.6	.0	44.6	.0	26.5	29.8	126.5	52.7
1724.7	229.1	84.2	37.8	73.7	13.3	108.8	68.2
985.4	.0	60.9	.0	16.6	23.6	40.9	258.3
2749.7	.0	117.9	.0	100.8	.0	46.1	19.6
1200.5	20.6	48.0	1.2	4.9	.0	8.9	.0
877.2	493.6	61.8	37.0	15.2	.5	8.1	.0
929.8	200.6	49.0	31.4	4.3	2.8	22.8	15.4
2129.4	.0	126.4	.0	64.8	.0	468.1	29.1
1635.7	.0	82.8	.0	1.2	.0	4.8	4.7
1978.3	284.6	145.8	21.0	4.0	.4	19.8	4.5
1466.9	.0	76.0	.0	29.6	3.4	28.3	17.1
1411.0	47.9	79.0	8.2	9.8	1.1	118.4	18.5
1730.3	147.4	102.0	.0	21.3	.7	104.9	17.0
1524.6	.0	68.9	.0	232.6	.0	.0	.0
1010.3	.0	48.1	.0	47.7	6.1	5.2	12.0
1247.2	.0	74.0	.0	2.9	.0	.0	2.7
1021.4	.0	55.2	.0	135.3	.0	.0	.0
1623.3	155.7	73.8	18.5	35.8	14.1	249.3	10.9
1439.0	.0	105.9	.0	.0	14.2	256.8	26.0
.0	.0	.0	.0	.0	.0	.0	.0
.0	.0	.0	.0	.0	.0	.0	.0
1137.1	110.1	81.9	6.6	5.5	16.2	.0	9.5
1012.8	.0	77.3	.0	8.5	8.9	.0	61.7
843.0	.0	43.4	.0	.0	29.2	.0	26.6
1097.0	.0	64.9	.0	34.6	.0	1.3	5.1
.0	.0	.0	.0	.0	.0	.0	.0
1627.6	.0	119.9	.0	53.7	3.1	.0	15.8
1496.7	.0	88.2	.0	124.8	10.4	7.6	.0
1043.1	.0	44.3	.0	30.6	.0	.5	.0
721.3	.0	34.1	.0	43.2	4.5	5.8	67.7
696.4	.0	31.2	.0	27.6	.0	44.8	14.5
1589.7	.0	58.2	.0	50.7	1.7	20.5	23.3
924.8	.0	66.9	.0	39.3	18.7	.0	63.7
2092.2	2.7	82.7	1.4	18.0	41.6	75.5	34.6
1906.2	.0	112.8	.0	49.7	.0	9.8	11.9
1237.8	.0	63.7	.0	33.4	10.8	31.1	74.7
.0	.0	.0	.0	.0	.0	.0	.0
1699.3	.0	100.6	.0	46.2	.0	9.2	12.6
115.8	.0	50.6	.0	28.7	2.8	.0	17.5

Analysis of Operational Definitions

Seven criteria for operational definitions were identified in a preceding section. This section will be used to analyze the extent to which the proposed operational definitions fulfill the criteria (see Table 2).

Table 2

Ability of Operational Definitions of Indicators to
Meet the Criteria for Operational Definitions

	Indicator			
Criterion	Graduates employed	Related employment	Employer satisfaction	Cost
• Is a measurable characteristic of the indicator	High	High	High	High
• Encompass essense of indicator	High	Medium	Medium	Medium
• Communicate a more specific understanding	Medium	High	High	High
• Describe operations necessary to make specified measurements	High	High	High	High
• Manupulable arithmatically	High	High	High	High
• Feasibility -availability -expertise -cost	High	High	High	Medium
• Yield consistent measures: time, investigators, places	High	High	High	High

Discussion. Summarized in Table 2 are the results of evaluating the ability of the proposed operational definitions of the indicators' to meet the criteria for adequate operational definitions. Judgement of the ability of the operational definitions to satisfy the criteria are indicated as being either high, medium, or low. A judgment of high means that the operational definition of a particular indicator meets a particular criterion relatively well. For example, the ability of the operational definition of the indicator, Number of Graduates Employed, is "high" as a measurable characteristic of the indicator, but only "medium" at being able to communitcate a more specific understanding because, although the definition is easily measured, it does not communicate the most specific measuring due to some inadequacy in the Follow-Up Report. The Follow-Up Report only reports on the graduates responding to a follow-up questionnaire; the lack of not including non-respondents increases the report's lack of completeness and decreases its accuracy and both these facts detract from the specificity of the operational definition. As non-respondents increase, the operational definition will become less specific regarding the percent of graduates employed because there are more graduates whose employment status is unknown.

Using these relative terms of high, medium and low most of the definitions were rated high in meeting the seven criteria. One exception, that of specificity, has already been discussed. Two other exceptions are discussed next.

The definitions of the indicators, Related Employment and Employer Satisfaction, although not deficient, were not as strong as would be desired in embodying the essence of their respective indicators. The determintion of related employment, as presently done is based on the coding of employment by individuals whose expertise about occupations and vocational programs can vary widely. This can lead to incorrect designations, thus incorrectly analyzing the data and not communicating valid percentages of the relatedness of graduates' employment.

The definition for employer satisfaction suffers from a problem with the nature of the question, that of asking the employer to rank the graduate. If the intent is to determine whether employers are satisfied with graduates' work as a way of indicating effects of vocational education, then more information is necessary concerning the "other" employees with whom the graduate is being compared. An employer could rank a graduate in the upper half of an employee group composed of workers trained on-the-job or rank that same graduate in the lower half of a peer group which also received vocational training but had had more experience, although doing the same kind of work, as specified on the Employer Questionnaire. For this reason, the data collected should indicate to whom the graduate is being compared, other than just other workers doing similar work. Additionally, there are contextual problems of the employers' criteria for ranking: personality differences; the nature of the work; and other significant factors which may enter into an employer's assessment of a graduate's work. For these reasons, the two definitions indicated above were only rated "medium" on their ability to meet the standards of this criterion.

The operational definition for the indicator, Cost, was judged "medium" on the feasibility criterion because this data is harder to obtain, involves somewhat more expertise to determine and is a bit more expensive due to the difficulty in obtaining it. The cost data is not part of the follow-up study and it must be obtained from different financial reports and then calculated, while the data for the other operational definitions come from just two tables of one report.

The cost definition was also "medium" at communicating the essence of the indicator. Instructional cost data mainly reflects instructor salaries and benefits, variables which are for the most part, based on tenure in the position. The data does not easily facilitate program or school comparisons, nor does it indicate a state's or school's commitment to a particular program.

Displaying Indicators

In preceding sections of this report, criteria for operational definitions have been suggested, operational definitions for four indicators have been proposed, and subsequently analyzed for their ability to meet the criteria. In this section, formats for displaying the data using the operational definitions will be presented and analyzed for their ability to meet certain suggested criteria.

Criteria for Adequate Display

The overall intent for displaying the operational definitions' data is to communicate a "message" of the "state" or success of vocational education in Minnesota. To accomplish this purpose in an efficient manner is a high order objective of the display format. Burdening the reader with extraneous data or failing to provide sufficient information can lead to failure in one of two ways. There could be a failure to communicate what is known, but more important, the reader could develop a false impression of vocational education. Aware of these concerns, the following criteria for display of indicators were proposed:

- Understandable;
- Focused; and
- Parsimonious.

If the display format is understandable, the essential message is communicated upon immediate observance of the display. Being focused means that the display, in addition to communicating the message, draws attention to the central aspect of that message. If the display is parsimonious, it will communicate the message, focusing upon its most salient feature, without "clouding" the display with unnecessary data.

Display Structure

The proposed display of the data for each indicator is likely to be multi-leveled in at least two dimensions. First each operational definition can be subdivided into finer and finer sub-components of the concept being measured (e.g., overall employer satisfaction, employer satisfaction with graduates' personal characteristics, employer satisfaction with graduates' acceptance of responsibility). Second the degree of program aggregation can be sub-divided in several ways (i.e., across all programs in the state, across all programs of the same kind in the state, across all programs in a particular school). Given these potential dimensions of indicator data, the proposed structure for displaying operational definitions is as outlined in Table 3.

As indicated in Table 3, the structure is one which initially displays data based upon the operational definition as proposed, and then upon more specific aspects of the operational definition. Using the operational definition of employer satisfaction as an example, Level I specificity would be the presentation of data indicating the percent of graduates ranked in the top half of their work group by their employer, and Level II specificity would be a display of employer ratings on two sub-components, personal characteristics and work characteristics.

Table 3
Structure for Display of Indicators

Level I - Specificity matched to indicator's operational definition (most aggregate)
  - Stage 1 - Average for each operational definition of all programs;
  - Stage 2 - Average for each program; and
  - Stage 3 - Average for each school within particular program.

Level II - Specificity matched to sub-components of indicators operational definition
  - Stage 1 - Average for each operational definition of all programs;
  - Stage 2 - Average for each program; and
  - Stage 3 - Average for each school within particular program.

Level III - Specificity matched to sub-components of sub-components of operational definition
  - Stage 1 - Average for each operational definition of all programs;
  - Stage 2 - Average for each program; and
  - Stage 3 - Average for each school within particular program.

At Stage 1, the statewide average for the operational definition, or a sub-component of it, is given. In Stage 2, the different program averages contributing to the respective statewide average is given. In Stage 3, the school averages within the specific programs are presented. A diagram of this structure is presented in Figure 20. The stage hierarchy exists for each level of specificty in definition.

Display Format

To further illustrate the presentation schedule, but more importantly, to illustrate the proposed format for displaying indicator information, actual data were gathered from the 1980 and 1981 Follow-Up and Program Budget/Financial Reports and are presented for different levels and stages. The format was designed to meet the criteria for display discussed earlier.

Level I, Stage 1. Exhibit 10 is a presentation of the statewide averages for each indicator for the selected time period.

Level I, Stage 2. In Exhibit 11, averages of the programs for each indicator shown in Exhibit 10 are presented. In this case six programs, representative of various areas of vocational education, are used, although all the programs in the state could be listed. The data are presented so

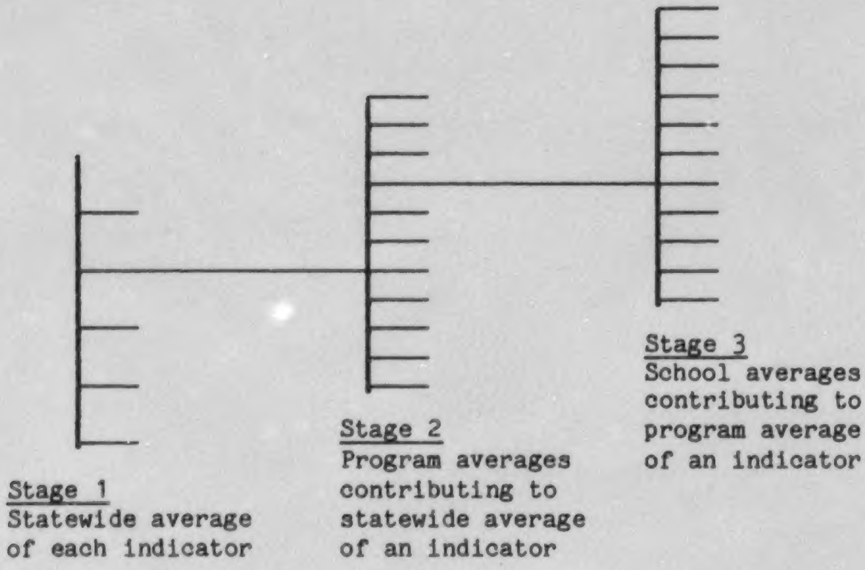

Stage 1
Statewide average of each indicator
Stage 2
Program averages contributing to statewide average of an indicator
Stage 3
School averages contributing to program average of an indicator

Figure 20. Diagram of three stages making up structure of indicator display for each level of definition specificity.

that each program average is seen in comparison to the statewide average for all programs.

Level I, Stage 3. In Exhibit 12 the same graphing format as used in Exhibit 11 is used to present the individual school averages for schools offering a similar program. As with programs, although it is possible to present averages of all the schools offering a particular program, only six schools were used.

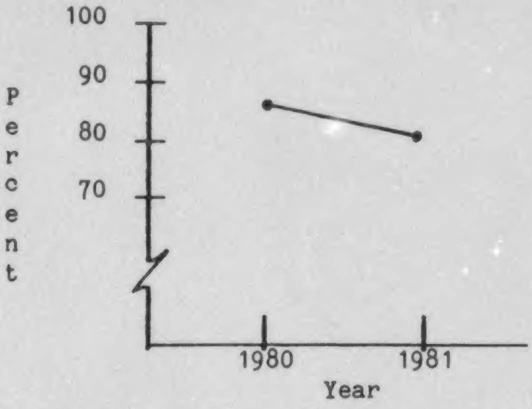
Level II, Stage 1. For each operational definition, it is useful to examine sub-components of the concept being addressed by the indicator. The operational definition of employer satisfaction is measured by the percentage of graduates ranked in the upper 50 percent of their work group by their employer. Sub-components of this measurement are the employers' rankings of the graduates on work characteristics and personal characteristics. The work characteristics: quality of work; quantity of work; job success knowledge; ability to operate equipment; and reading, verbal and computational skills -- all are from the questions of Section II of the Employer Questionnaire. The results of these questions are then tabulated in Table 17 of the *1981 Follow-Up Report*. Exhibit 13 is a display of these Employer Questionnaire and *Follow-Up Report* items.

Exhibit 10

Level 1, Stage 1 Display

Indicator: Number of graduates employed.

Definition: Percentage of graduates employed at the time of the follow-up study.



Indicator: Number of graduates employed in occupation related to program.

Definition: Percentage of graduates responding to questionnaire and employed in occupations broadly or closely related to training program.

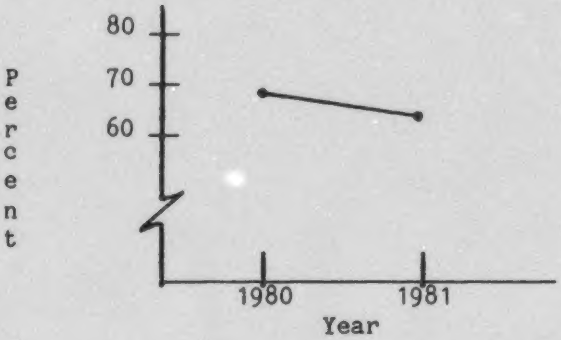
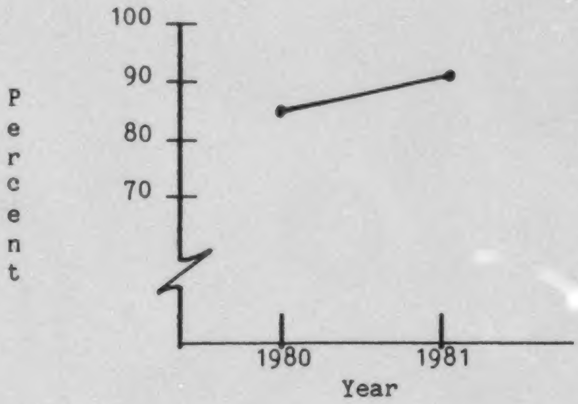


Exhibit 10 (Continued)

Indicator: Employer satisfaction with quality of graduate's work.
Definition: Percentage of graduates ranked in upper half of employees performing similar work by employer.



Indicator: Program cost.
Definition: Instructional cost per average daily membership.

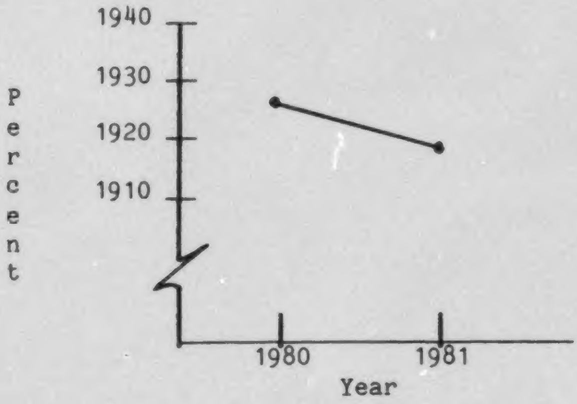
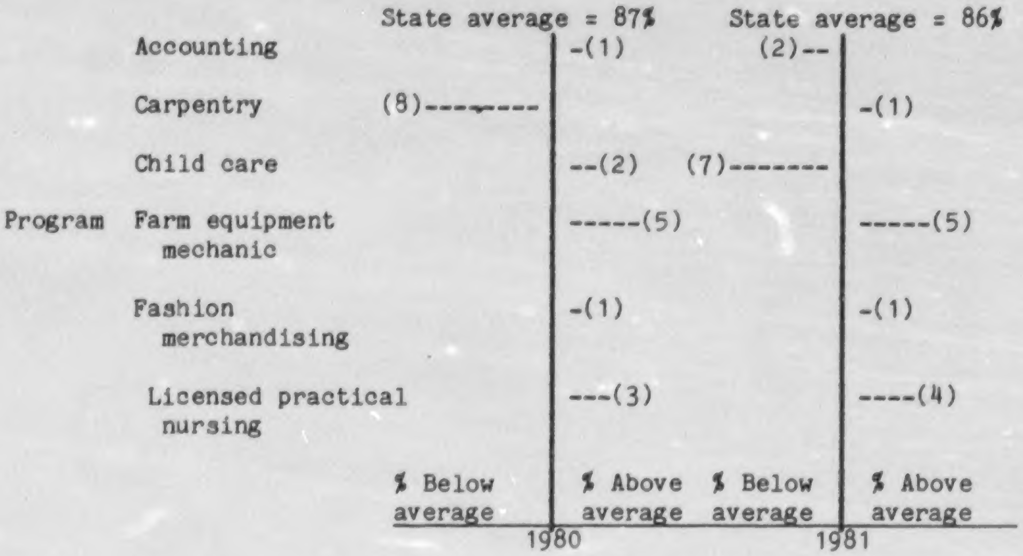


Exhibit 11

Indicator: Number of graduates employed.
Definition: Percentage of graduates employed at the time of the follow-up study.



Indicator: Number of graduates employed in occupation related to program.
Definition: Percentage of graduates responding to questionnaire and employed in occupations boradly or closely related to training program.

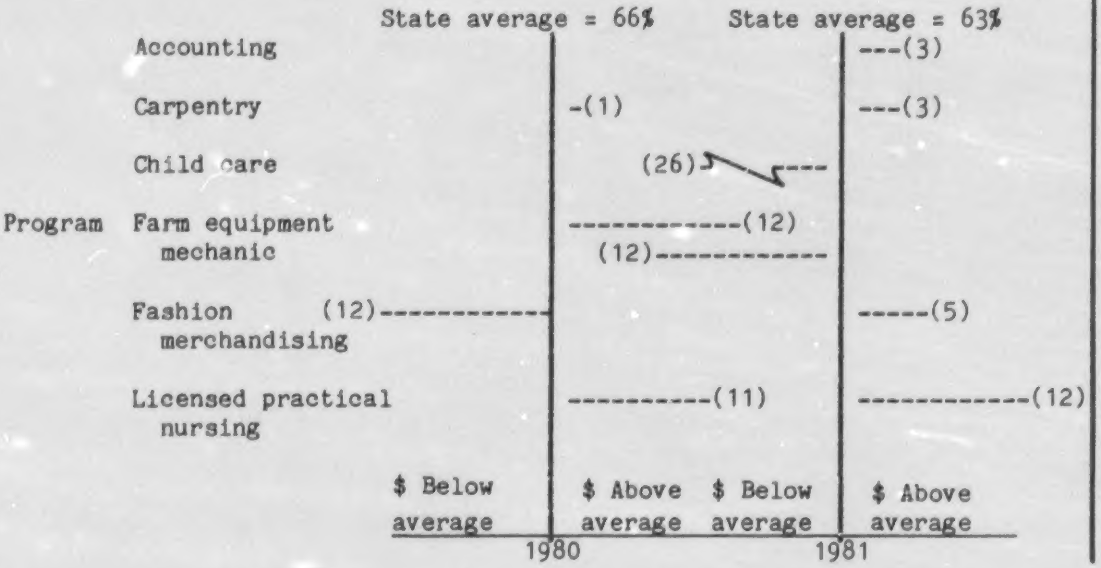


Exhibit 11 (Continued)

Indicator: Employer satisfaction with quality of graduate's work.
Definition: Percentage of graduates ranked in upper half of employees performing similar work by employer.

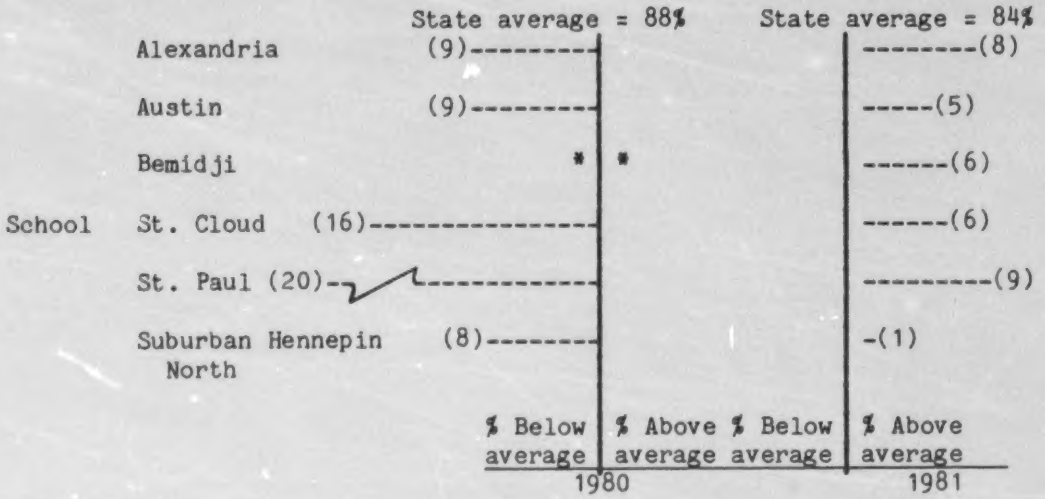
Program	1980 (State average = 86%) % Below Average	1980 (State average = 86%) % Above Average	1981 (State average = 87%) % Below Average	1981 (State average = 87%) % Above Average
Accounting		-------(7)		---(3)
Carpentry		---------(9)	(1)-	
Child care		------(6)		-----(5)
Farm equipment mechanic		-----------(11)		--------(8)
Fashion merchandising	(1)-		(4)----	
Licensed practical nursing	(3)---		(5)-----	

Indicator: Program cost.
Definition: Instructional cost per average daily membership.

Program	1980 (State average = $1380) $ Below average	1980 (State average = $1380) $ Above average	1981 (State average = $1428) $ Below average	1981 (State average = $1428) $ Above average
Accounting	(232)-----		(169)---	
Carpentry	(239)-----		(148)---	
Child care	(79)--			--(111)
Farm equipment mechanic	(49)-		(52)-	
Fashion merchandising	(75)--			-(49)
Licensed practical nursing		---------(464)		-----------(552)

Exhibit 12
Level I, Stage 3 Display for Carpentry Program

Indicator: Number of graduates employed.
Definition: Percentage of graduates employed at the time of the follow-up study.



Indicator: Number of graduates employed in occupation related to program.
Definition: Percentage of graduates responding to questionnaire and employed in occupations broadly or closely related to training program.

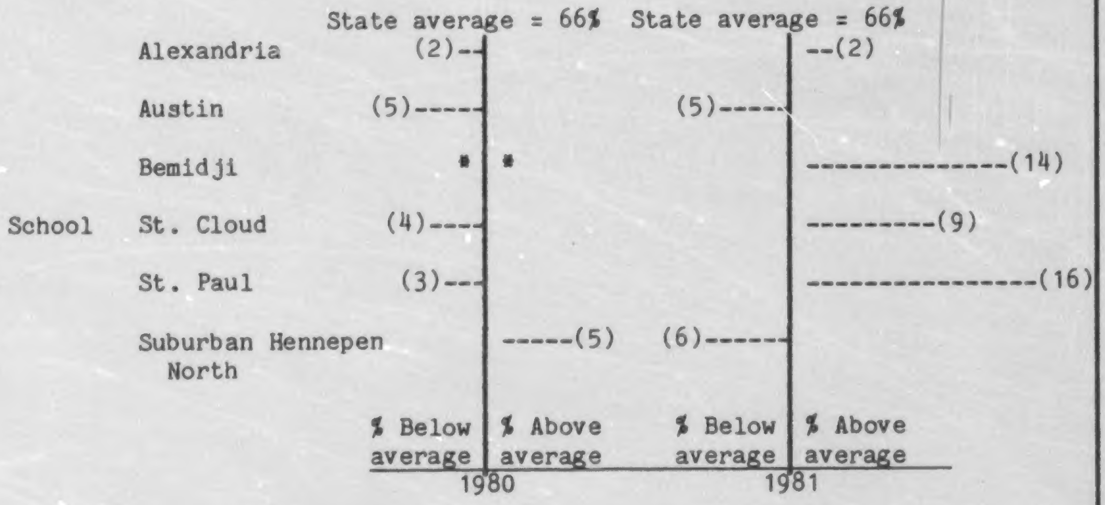


Exhibit 12 (Continued)

Indicator: Employer satisfaction with quality of graduate's work.
Definition: Percentage of graduates ranked in upper half of employees performing similar work by employer.

School	1980 State average = 86% % Below average	1980 % Above average	1981 State average = 87% % Below average	1981 % Above average
Alexandria		(14)		(13)
Austin		(1)	(5)	
Bemidji	*	*		(13)
St. Cloud		(14)		(13)
St. Paul		(14)		(2)
Suburban Hennepin North	(15)		(12)	

Indicator: Program cost.
Definition: Instructional cost per average daily membership.

School	1980 State average = $1390 $ Below average	1980 $ Above average	1981 State average = $1428 $ Below average	1981 $ Above average
Alexandria	(231)		(212)	
Austin	(112)		(238)	
Bemidji		(49)		(128)
St. Cloud	(10)		(234)	
St. Paul	(116)		(176)	
Suburban Hennepin North	**	**	**	**

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*This data for Bemidji was missing from the State Department of Education.

**Data is given by district. Suburban Hennepin has two schools, and individual school totals were not given.

Exhibit 13

Work Characteristics Items of the Employer Questionnaire and 1981 Follow-Up Report

Questions

II. In comparison with other workers in the same work group, how would you rate the employee on each of the following characteristics?

	above average	about average	below average	
1. The quality of employee's work	1	2	3	(25)
2. The quantity of employee's work	1	2	3	(26)
3. The degree to which the employee possesses specific job-related knowledge important to success on this job	1	2	3	(27)
4. The degree to which the employee is able to operate the equipment and apparatus used on the job	1	2	3	(28)
5. The degree to which the employee possesses basic reading, verbal and computational skills	1	2	3	(29)

Report

17. EMPLOYERS' RATINGS OF SELECTED WORK CHARACTERISTICS

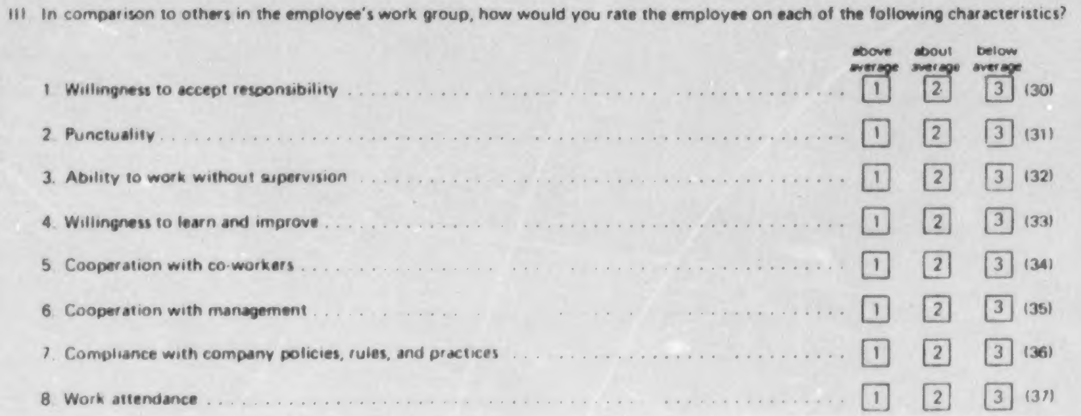
ITEM	ABOVE AVER. NO.	ABOVE AVER. PCT.	ABOUT AVER. NO.	ABOUT AVER. PCT.	BELOW AVER. NO.	BELOW AVER. PCT.
1. QUALITY OF WORK	2689	52.08	2317	44.87	157	3.04
2. QUANTIFY WORK	2129	41.21	2748	53.20	288	5.57
3. JOB SUCCESS KNOWLEDGE	2091	40.57	2788	54.09	275	5.33
4. CAN OPERATE EQUIPMENT	2433	47.27	2600	50.51	144	2.21
5. READ/VERBAL COMP. SKILLS	2102	40.81	2812	54.60	236	4.58

The data for personal characteristics: acceptance of responsibility; punctuality; ability to work independently; willingness to learn; cooperation with co-workers; cooperation with management; compliance with rules; and attendance at work -- all are collected with the Section III questions from the Employer Questionnaire and reported in Table 18 of the 1981 Follow-Up Report. Examples of each are presented in Exhibit 14.

Exhibit 14

Personal Characteristics Items of the Employer Questionnaire and 1981 Follow-Up Report

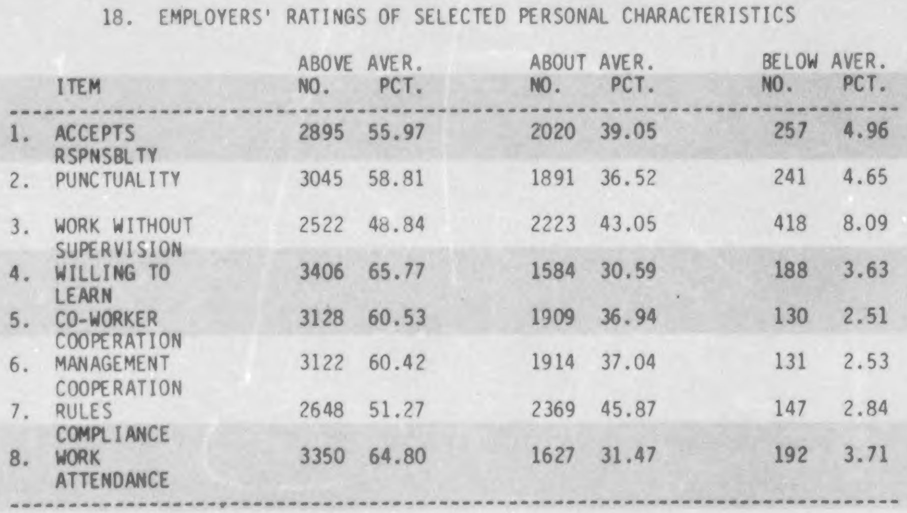
Questions



III. In comparison to others in the employee's work group, how would you rate the employee on each of the following characteristics?

	above average	about average	below average	
1. Willingness to accept responsibility	1	2	3	(30)
2. Punctuality	1	2	3	(31)
3. Ability to work without supervision	1	2	3	(32)
4. Willingness to learn and improve	1	2	3	(33)
5. Cooperation with co-workers	1	2	3	(34)
6. Cooperation with management	1	2	3	(35)
7. Compliance with company policies, rules, and practices	1	2	3	(36)
8. Work attendance	1	2	3	(37)

Report



18. EMPLOYERS' RATINGS OF SELECTED PERSONAL CHARACTERISTICS

ITEM	ABOVE AVER. NO.	ABOVE AVER. PCT.	ABOUT AVER. NO.	ABOUT AVER. PCT.	BELOW AVER. NO.	BELOW AVER. PCT.
1. ACCEPTS RSPNSBLTY	2895	55.97	2020	39.05	257	4.96
2. PUNCTUALITY	3045	58.81	1891	36.52	241	4.65
3. WORK WITHOUT SUPERVISION	2522	48.84	2223	43.05	418	8.09
4. WILLING TO LEARN	3406	65.77	1584	30.59	188	3.63
5. CO-WORKER COOPERATION	3128	60.53	1909	36.94	130	2.51
6. MANAGEMENT COOPERATION	3122	60.42	1914	37.04	131	2.53
7. RULES COMPLIANCE	2648	51.27	2369	45.87	147	2.84
8. WORK ATTENDANCE	3350	64.80	1627	31.47	192	3.71

A problem encountered using Table 17 and Table 18 for sub-components of data obtained from Table 19 of the 1981 Follow-Up Report was that the data are categorized differently, precluding comparison between overall employer satisfaction and each of the sub-components. When determining employer satisfaction from the data in Table 19, satisfaction was the percentage of graduates rated in the upper 50 percent of their work group by their employer. In Table 17 and Table 18, the classifications: above average; about average; and below average -- all are used. It is difficult to compare these data to those of Table 19, although the ratings on the work characteristics and personal characteristics are sub-components of overall employer satisfaction. It is also necessary to make an arbitrary decision regarding how the Table 17 and Table 18 data explain employer satisfaction. Should satisfaction be above average or should it also include those receiving average ratings? Whatever the decision, neither choice will result in comparable data to that of overall employer satisfaction; therefore, it is only possible to consider data for the various stages of display somewhat independently. Further, employer satisfaction as displayed here will include all those rated above average and about average. This is based upon the assumption that an employer can be satisfied with an average worker. Using this method of calculation, it is possible to calculate employer satisfaction for the two sub-components of overall satisfaction. The results of these calculations are presented in Exhibit 15.

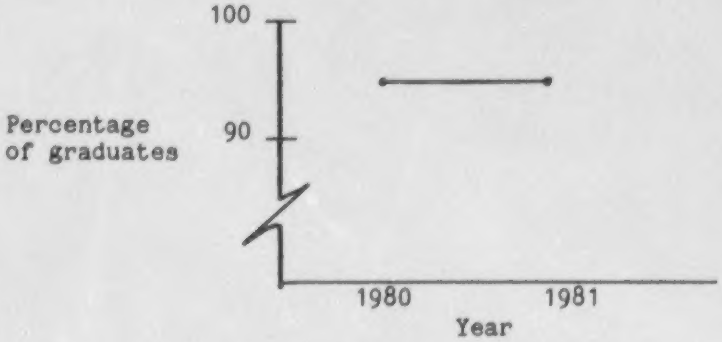
Analysis of Display Structure and Format

In a previous section three criteria were suggested for analyzing the display of the indicators. Table 4 summarizes an analysis of the proposed display structure and format using those criteria.

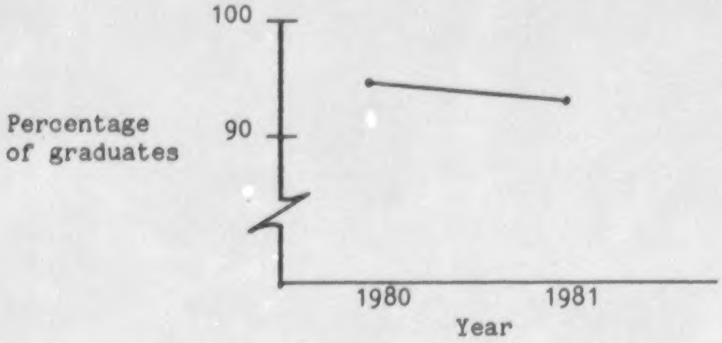
As observed from Table 4, the display format adhered to the criteria. The greatest advantage of the display was the overall conceptual structure involving the different levels and stages within levels. In this manner, one could analyze a program in all the schools in which it is offered (Stage 3), or all programs, for a particular indicator (Stage 2), by examining a particular graph. Should it be necessary to examine the statewide average of an indicator from year-to-year that is also available without distracting data (Stage 1).

Exhibit 15
Level II, Stage 1 Display

Indicator: Employer satisfaction: work characteristics of graduates.
Definition: Percentage of graduates about average or above average in work characteristics.



Indicator: Employer satisfaction: personal characteristics of graduates.
Definition: Percent of graduates about average or above average in personal characteristics.



The Stage 2 and Stage 3 formats stress a comparison of programs or schools with an average rather than change from year-to-year, although it is possible to follow, horizontally, the pattern of a particular program or school. This emphasis reflects the assumption that it is more important to know how a program differs from all other programs each year or how a program differs in different schools than over a period of years. The power of this format was echoed in the Work Group discussions of these displays in the way

Table 4
Ability of Display Format Structure to Meet Suggested Criteria

	Display structure				
Criterion	Level I, stage 1	Level II, stage 2	Level I, stage 3	Level II, stage 1	Overall scheme
Understandable	Yes	Yes	Yes	Yes	Yes
Focused	Yes	Yes	Yes	Yes	Yes
Parsimonious	Yes	Yes	Yes	Yes	Yes

it drew their attention to important characteristics of the data, seem clear with minimum explanation, and followed a logical path of their thinking and questioning about what was being communicated.

Although not a part of the analysis for the display scheme, the example of Level II, Stage 1, illustrates the inadequacy of the existing data base. Since different response patterns are used for the questions generating the data for overall employer satisfaction than for particular sub-component characteristics of graduates, there can be no comparison between the overall indicator and its sub-components. A standardized response pattern could solve this problem, and increase the usefulness of the data.

Benchmarks for Indicators

Implicitly, the topic of benchmarks for vocational education indicators has already been partially addressed in previous sections of this chapter, particularily the section on indicator display. In this section, the discussion will be more explicit as to benchmark definition, considerations in setting benchmarks, and ways to go about doing it.

Definition and Purpose of Benchmarks

In Webster's New Collegate Dictionary (1979), a benchmark is defined as:

1. A point of reference from which measurements may be made; and
2. Something that serves as a standard by which others may be measured.

Both definitions imply the meaning that a benchmark is a standard or reference point for making a measurement, which in turn presumably will be used to make a judgement of some consequence. That judgement will be based on an interpretation of the differences between the benchmark and the actual characteristics of the object, organism, or phenomenon under observation. In the case being described here, the phenomenon under observation is vocational education in Minnesota. The characteristics of concern are those described by selected vocational education indicators. The actual characteristics are as described through the operational definition of indicators and display of data pertaining to a particular time and place using these definitions.

In order to make judgements about the "health" of vocational education, it is necessary to know whether or not the status of its important actual characteristics is adequate or acceptable. A common approach to judgements of this kind is to make a comparison; the question is, "Comparison to what?" And after comparison, "How large a difference is important to be attentive to?" The first question requires setting benchmarks of the kind described above. The second question can be partially resolved by where the benchmark is set. That is, the benchmark can be set at a point above which (as for program cost) or below which (as for employment rate) any discrepancies are important enough to merit attention.

Factors to Consider in Setting Benchmarks

There are many factors which enter into the process of setting benchmarks. Some suggested by the Work Group are as follows:

- Purpose for which benchmarks will be used. For example, should benchmarks be set differently for purposes of different groups such as the state department of education versus local boards of education or for different functions such as creating a political image versus funding decisions versus selecting programs to be revitalized?
- Process used to set benchmarks. For example, who is involved in the deliberations, what is the appeal process for those not meeting the

benchmark, what are the attenvating circumstances which will be considered, are the benchmarks set in policy, how easy is it to change the benchmarks, what is the process for change?

- Responsiveness of benchmarks to changing economic and social conditions. For example, how are the benchmarks responsive to economic downturns or upturns, differences in geographic areas, differences between programs in serving the hard to train and employ, financial resources available to operate programs, declining enrollments, changes in ages of students, and changes in industrial technology? Many of these factors are out of control of vocational education teachers and managers.
- Relation of benchmarks for vocational education to those of others involved in similar activities. For example, how are the benchmarks related to those used for training conducted by private vocational schools, on-the-job colleges and universities?
- Reasonableness of benchmark. For example, is it reasonable to expect that 100 percent of graduates should be employed in an occupation related to their training? Is it reasonable to expect 100 percent of employers to be above average in their satisfaction with graduates work? It is not even possible for all programs to be below average in program cost! If these extremes are not possible, what is reasonable?

The above factors would suggest that the process of setting benchmarks will not be easy. Rather, what is needed is some experience with different types of benchmarks used for different purposes over a period of time. During this experience, serious reflection and dialogue should be focused on what seems to "work" in view of the many and complex considerations involved. As with indicators, the setting of benchmarks must involve delimiting a process of doing the setting as much as the actual settings. Both must remain continually open to questioning, discussion and change to insure improvement.

Ways of Setting Benchmarks

There are several approaches to setting benchmarks some of which are already implicit in the indicator displays presented in the previous section.

For example benchmarks can be established by comparison of a program to the average (or other measures of central tendency) of other programs of the same kind (see Exhibit 12). Or, comparisons can be made to the status of the same program in previous time periods (see Exhibit 12 again) as a way to detect trends or, more importantly, changes in trends. Or comparisons can be made to different types of programs for the same time period (see Exhibit 11). These benchmarks could be made more sophisticated by using ranges rather than fixed points or indexing the benchmarks to economic conditions such as the growth in Gross National Product or the unemployment rate. Each of these approaches may be appropriate for different purposes of comparisons. Some of these considerations have been attempted to be sorted out in developing the display structure and format already proposed.

Yet another approach would be to set more absolute types of benchmarks which are largely based on considerations external to the nature of the programs. For example, it might be decided that at least one half of graduates ought to be employed if the program is to be considered at all viable on the basis of "just" general principles. Another approach to more absolute benchmarks used by economists in a cost-benefit sense is to focus on rate of return to investment in a particular enterprise. In the case of vocational education, the benchmark discussion would center on the return on investment in training to students and the larger society. Does a dollar invested in a particular vocational education program return the same amount as in another program? Is the return at least as much or more than a dollar invested in other income producing investments such as health, general education, transportation or economic development? Here it is possible to use the same benchmark across a wide variety of investment options.

Combining Indicators

Sometimes for the sake of brevity and focus it is most useful to combine indicators in one chart or even in one composite indicator (analogous to the consumer price index). Each of these strategies, contrasting two indicators and developing a composite index, requires a different approach.

Contrasting Two Indicators

In examining the relationship between two indicators, the approach is to chart them on the same diagram using the criteria for display discussed previously. For example, suppose one wished to assess various program offerings in terms of the indicators of placement in related occupations and employer satisfaction with the quality of graduate's work. The information concerning these two indicators for the vocational education programs examined earlier in this section is shown in Table 5. The information could be plotted as shown in Figure 21 in order to see the relationship between the indicators. Using the statewide average as a dividing line, four groups of programs emerge:

- High related placement/high satisfaction (Accounting, Farm equipment mechanics)
- High related placement/low satisfaction (Nursing, Carpentry)
- Low related placement/high satisfaction (Child care)
- Low related placement/low satisfaction (Fashion merchandising)

Using this inforamtion, it may be possible to better prioritize programs in terms of effectiveness. Other lines could be added to reflect acceptable ranges or benchmarks for indicators (minimum and maximum). Similar plots could be constructed for other combinations of indicators. For example, program cost might be used as the horizontal axis for joint consideration with a number of other indicators to focus on cost-effectiveness of programs.

Developing Composite Indicators

At times, for the sake of simplicity and focus, it is most useful to use one overall indicator in discussions concerning the reviewing, planning, and providing of public information about vocational education. When this is the case, it may be most appropriate to use a combination of indicators rather than select one indicator alone. The process of developing composite indicators will be illustrated below for two situations, one which uses very imprecise information about an indicator and the other very precise information.

Operating with imprecise information. Using the information from Table 5 for the indicators of related placement and employer satisfaction with the quality of graduate's work and with the statewide average used as a cutting line between high and low, the following rating is possible to develop:

High = above average = 1

Low = below average = 2

Table 5
Related Placement and Employer Satisfaction with Quality of Graduate's Work Indicators for Selected Sample of Post-Seondary Vocational Education Programs
Statewide Average, 1981

Program	Related placement indicator	Employer satisfaction indicator
Accounting	66%	90%
Carpentry	66	86
Child care	37	92
Farm equipment mechanic	68	95
Fashion merchandising	51	83
Nursing (LPN)	75	82
Statewide average	63	87

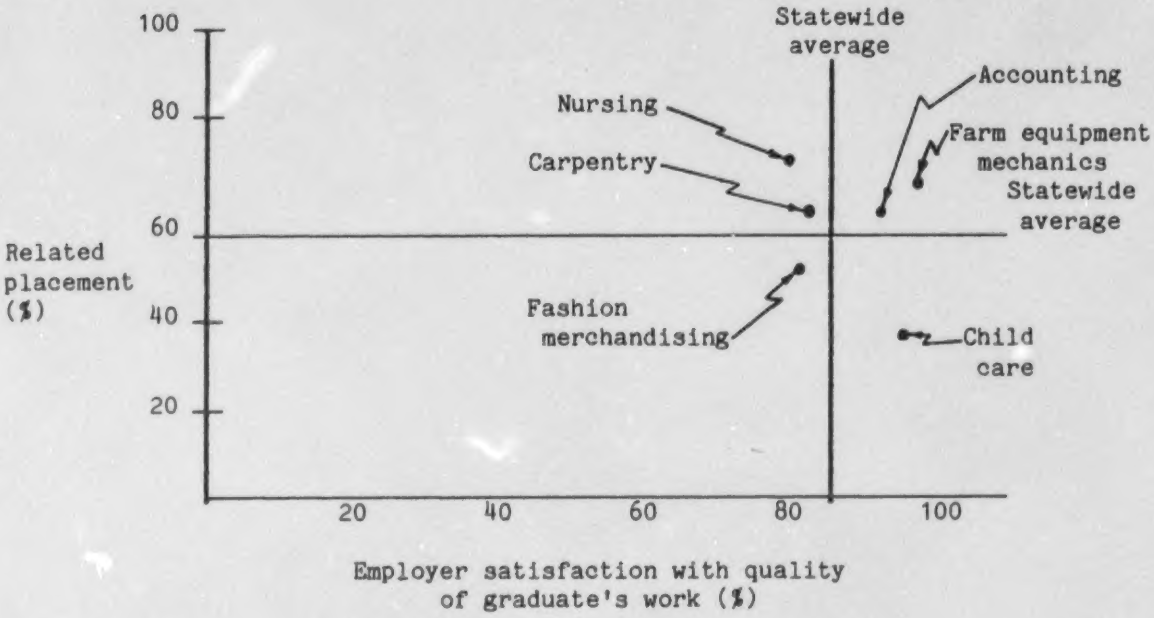


Figure 21. Relation of percent related placement indicator and employer satisfaction with quality of graduate's work indicator.

Then, the needed information on the sample of selected programs can be derived as shown in Table 6.

Table 6
Imprecise Ratings of Related Placement and Employment Satisfaction with Quality of Graduate's Work Indicators

Program	Related placement rating	Employer satisfaction rating
Accounting	1	1
Carpentry	1	2
Child care	2	1
Farm equipment mechanic	1	1
Fashion merchandising	2	2
Nursing (LPN)	1	2

This information showing an imprecise rating could be developed into a composite indicator by simply adding the ratings for the two indicators for each program. The results of this process are shown in Table 7. Using this new, composite indicator, programs could have a rating of values 2 to 4, with 4 being lowest. With the composite indicator, each individual component indicator is being weighted equally. If this were not desired, and for example, related placement was considered much more important than employer satisfaction, the related placement indicator might be given a weight of two. Using the weighting procedure gives the results shown in Table 8. Notice that the composite indicator now ranges from 3 to 6.

Operating with precise information. If detailed information about each of the indicators is readily available as is evident in Table 5, the indicator information can be converted to index numbers and then combined into a composite index. For example, related placement could be indexed such that 100 is set as the statewide average for all programs (i.e., 63% in this case). Given that a related placement of 63% is indexed at 100, then a related placement for accounting (66%) is equal to 100(66)/63 = 105. The same process could be used with the employer satisfaction with quality of graduate's work indicator. If this process were carried through with the information in Table 5, it would appear as in Table 9.

Table 7
Composite Indicator of Imprecise Rating of
Related Placement and Employer Satisfaction with
Quality of Graduate's Work Indicators

Program	Related placement indicator	Employer satisfaction indicator	Composite indicator
Accounting	1	1	2
Carpentry	1	2	3
Child care	2	1	3
Farm equipment mechanic	1	1	2
Fashion merchandising	2	2	4
Nursing (LPN)	1	2	3

Table 8
Weighted Composite Indicator or Imprecise Rating of
Related Placement and Employer Satisfaction with Quality
of Graduate's Work Indicators

	Related placement			Employer satisfaction			Composite indicator
Program	Rating	Weight	Weighted rating	Rating	Weight	Weighted rating	
Accounting	1	2	2	1	1	1	3
Carpentry	1	2	2	2	1	2	4
Child care	2	2	4	1	1	1	5
Farm equipment mechanics	1	2	2	1	1	1	3
Fashion merchandising	2	2	4	2	1	2	6
Nursing	1	2	2	2	1	2	4

The composite of the indicators could now be developed by simply adding the index numbers for a particular program and dividing by two to get an average. The results of this process are shown in Table 10. The indexed indicators could also be weighted, as was shown in Table 8, and the results would appear as in Table 11. The use of index numbers has the advantage of being able to better directly compare the different indicators for the same program (because the indexes have a common base of 100).

Table 9
Index Indicators of Related Placement and Employer Satisfaction with Quality of Graduate's Work

Program	Related placement index	Employer satisfaction index
Accounting	105	103
Carpentry	105	99
Child care	59	109
Farm equipment mechanic	108	95
Fashion merchandising	81	94
Nursing (LPN)	119	94
Statewide average	100	100

Table 10
Unweighted Composite Indexed Indicators of Related Placement and Emplcyer Satisfaction with Quality of Graduate's Work

Program	Related placement index	Employer satisfaction index	Composite index
Accounting	105	103	104
Carpentry	105	99	102
Child care	59	109	84
Farm equipment mechanic	108	95	102
Fashion merchandising	81	94	88
Nursing (LPN)	119	94	107

Table 11
Weighted Composite Indexed Indicators of Related Placement and Employer Satisfaction with Quality of Graduate's Work

	Related placement			Employer satisfaction			Composite index
Program	Index	Weight	Weighted index	Index	Weight	Weighted index	
Accounting	105	2	210	103	1	103	104
Carpentry	105	2	210	99	1	99	103
Child care	59	2	118	109	1	109	76
Farm equipment mechanics	108	2	216	95	1	95	104
Fashion merchandising	81	2	162	94	1	94	85
Nursing	119	2	238	94	1	94	111

Summary

The focus of this chapter was essentially to try to learn about the process of developing vocational education indicators by actually "pushing ahead" with those indicators thought to be important and for which reasonably adequate data already existed. The steps in indicator development which were faced involved: (1) developing operational definitions, (2) displaying indicators, (3) setting benchmarks, and (4) combining indicators. From this experience the following summary points seem justified:

- Adequate operational definitions can be constructed for some indicators which utilize existing information.
- Displaying indicators involves considerations of both structure and format as a means to be understandable, focused and parsimonious. A structure and format which seemed to meet these criteria was proposed and illustrated.
- Setting benchmarks for judging the adequacy of vocational education involves choosing appropriate comparisons. Appropriatness depends on purpose, process used, desired degree of responsiveness to external factors, and judgements of what is reasonable. Benchmarks become an integral part of indicator display and a basis for subsequent interpretation.
- Combining indicators allows focus on the inter-relationship between indicators and summary of general condition across several indicators.

As with the process of indicator verification discussed in the previous Chapter, each of the steps in indicator development must remain open to questioning and discussion. Far too little experience is available to make long lasting decisions about the exact way a vocational education indicator ought to develop at this point in time.

CHAPTER IV.
FURTHER DEVELOPMENT OF INDICATORS WITHOUT ADEQUATE DATA

Two of the indicators previously posed as important for vocational education in Minnesota were judged to be inadequate in data or, at least, in analysis of existing data to merit the direction of development described in the previous chapter. These indicators were:

- Projected job openings in occupations related to training; and
- Occupations for which program is designed to provide training.

The strategy chosen for these indicators was analyses of existing data and attempts to improve this data. The purpose was to examine ways to make better use of what information was available or make recommendations for its improvement as a prerequisite to the indicator development illustrated in Chapter III.

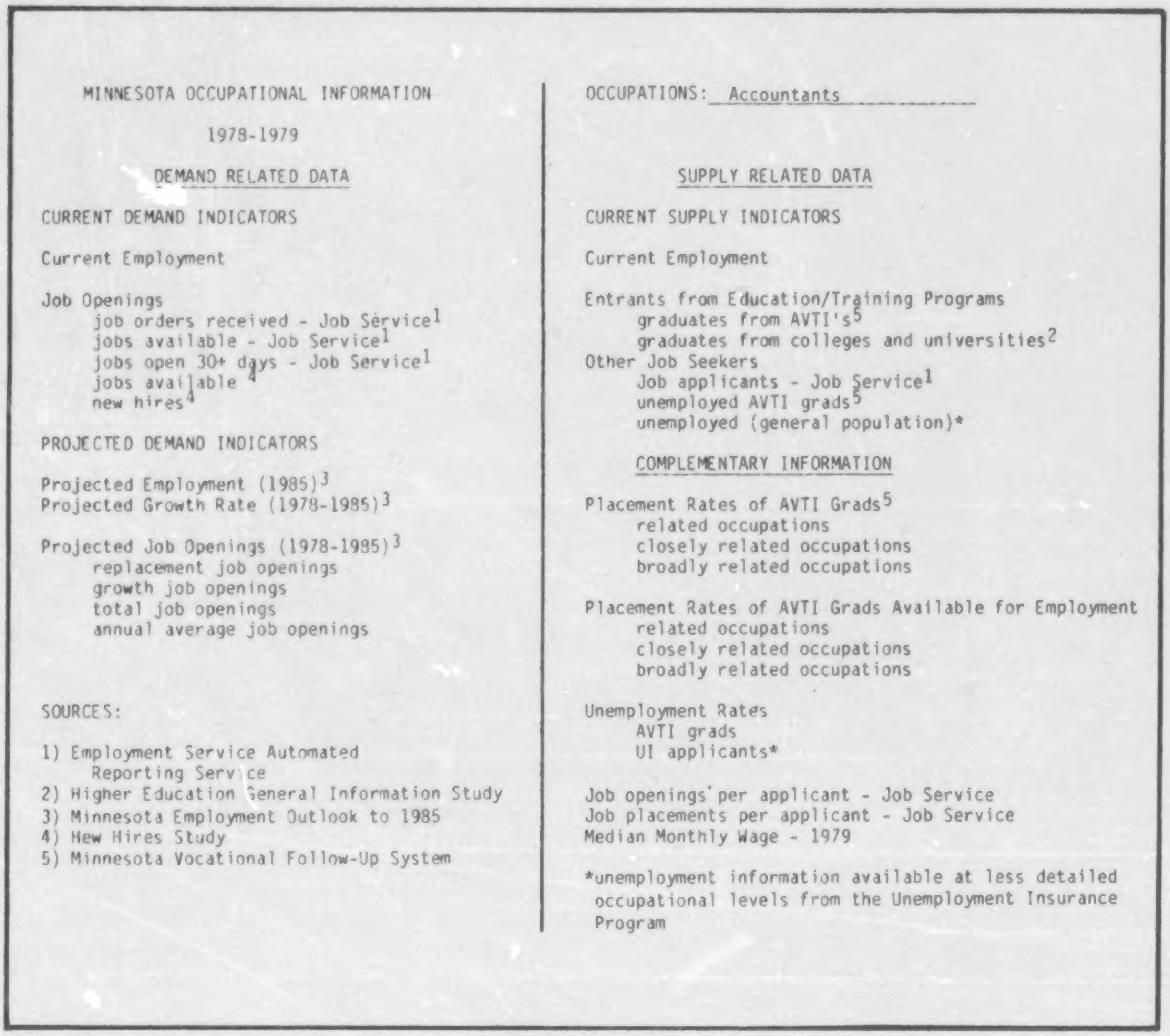
Projected Job Openings in Occupations Related to Training

The necessary information to estimate the number of job openings for graduates of a particular vocational education program is not currently (and may never be) available in ideal form. Rather it is (and will likely remain to be) a matter of making the best use what is available and working to improve what is available. Major factors preventing quick and substantial improvement are cost, staff training and time and inter-agency coordination.

Some Efforts At Projecting Job Openings

The format worked out by the Minnesota Research and Development Center for interfacing labor market supply and demand information (1981) represents an attempt to make best use of available information. An example of the application of this format is shown as Exhibit 16. The major constraint preventing the development of this format for other occupations is cost. A major limitation of the format is the lack of narrative analysis of what the information should mean for educational program planning or career selection.

Exhibit 16. MRDC Format for Displaying Supply/Demand Information Related to a Specific Occupation



MINNESOTA OCCUPATIONAL INFORMATION

1978-1979

DEMAND RELATED DATA

CURRENT DEMAND INDICATORS

Current Employment

Job Openings
- job orders received - Job Service[1]
- jobs available - Job Service[1]
- jobs open 30+ days - Job Service[1]
- jobs available [4]
- new hires[4]

PROJECTED DEMAND INDICATORS

Projected Employment (1985)[3]
Projected Growth Rate (1978-1985)[3]

Projected Job Openings (1978-1985)[3]
- replacement job openings
- growth job openings
- total job openings
- annual average job openings

SOURCES:

1) Employment Service Automated Reporting Service
2) Higher Education General Information Study
3) Minnesota Employment Outlook to 1985
4) New Hires Study
5) Minnesota Vocational Follow-Up System

OCCUPATIONS: Accountants

SUPPLY RELATED DATA

CURRENT SUPPLY INDICATORS

Current Employment

Entrants from Education/Training Programs
- graduates from AVTI's[5]
- graduates from colleges and universities[2]

Other Job Seekers
- Job applicants - Job Service[1]
- unemployed AVTI grads[5]
- unemployed (general population)*

COMPLEMENTARY INFORMATION

Placement Rates of AVTI Grads[5]
- related occupations
- closely related occupations
- broadly related occupations

Placement Rates of AVTI Grads Available for Employment
- related occupations
- closely related occupations
- broadly related occupations

Unemployment Rates
- AVTI grads
- UI applicants*

Job openings per applicant - Job Service
Job placements per applicant - Job Service
Median Monthly Wage - 1979

*unemployment information available at less detailed occupational levels from the Unemployment Insurance Program

The Minnesota Occupational Information Coordinating Committee (MOICC), at the recommendation of the study report prepared by the MRDC, has begun providing narrative analysis of selected occupations as part of its newsletter entitled, News-Net. An example of this analysis is shown as Exhibit 17. The major constraint with this information is that only selected occupational areas are covered, one per issue of News-Net, a quarterly publication.

Exhibit 17

MOICC Format for Narrative Analysis of Supply/Demand for an Occupational Area

CAREER BRIEFS...

INTRODUCING A NEW SERIES OF ARTICLES

In response to the requests of readers expressed in our survey last Summer, as well as the direction of the MOICC Board, we are initiating a new series of articles analyzing supply and demand for selected occupations.

Further, we will strive to use information sources which have not generally been presented heretofore. An "editorial board" comprised of the most qualified representatives of labor market analysts and user and producer groups will review articles prior to publication.

Each issue will contain articles on a number of related occupational tions similar to the series, "Selected Legal Occupations," in this issue. We are actively seeking your feedback on the articles in regard to format, content and validity. Also, let us know which ocupations you would like to see profiled in future issues. Please call or write News-Net at your convenience.

OUTLOOK FOR LAWYERS

In 1978 approximately 487,000 people worked as lawyers in the United States. Approximately 70% were in private practice, while the balance worked in government and corporate envoronments. For information on the nature of the working conditions, education, etc., please consult the Occupational Outlook Handbook.

The number of individuals employed as lawyers in Minnesota rose from 4,642 in 1970 to 8,130 in 1978 and will climb to 10,179 in 1985, according to estimates based on the 1970 census. The number grew by 75 percent in the 1970's; however, that growth rate drops to 25 percent between 1978-85. Compared to overall growth rates of 14.4 percent for all workers, lawyers will increase faster than average (25%) during the 1978-85 period.

Reports from the 3 local law school placement offices (University of Minnesota, William Mitchell and Hamline) show that the vast majority of recent law school graduates have otained a position in their chosen field within a year. More than 700 graduates were reported by the three law schools in 1981. Typically, more than 85% of the graduates pass the bar examination and are employed each year. On the average it is projected that 692 jobs will be open annually through 1985.* Competition for jobs is expected to remain intense throught the 80's and lawyers with work experience will have the advantage as employers continue to be highly selective in hiring new laywers.

According to the American Bar Association, lawyers in Minneapolis who had one year of experience were earning from $14,000 to $28,000 in 1980. Average starting salaries varied from $17,520 for graduates beginning with the State government to $17,800 for those hired by business firms to $20,000 for those starting with the federal government in 1980. Local information on migration patterns and occupational mobility are not currently available for this analysis.

The Bureau of Labor Statistics, U.S. Department of Labor (Bulletin 2052, September 1980) describes the outlook as follows, "The best prospects for establishing new practices will be in small towns and expanding suburbs, although this will remain a risky and expensive venture. An increasing proportion of law graduates will enter administrative and managerial positions for which legal training is an asset but not normally a requirement."

It is apparent, while unsubstantiated, that the demand for lawyers, or more appropriately, legal services is a function of disposable income and federal social, environmental, and economic (primarily business) legislation. Examples include the Civil Rights Act, EEO, OSHA, etc. If there is a retrenchment on such legislation and an effort to simplify (deregulate) business dealings (i.e., less anti-trust activity and less strict environmental laws), this could reduce the level of litigation activities and consequently, the demand for legal services. More detailed analysis is needed; however, if the demand for legal services declines, the outlook for all legal occupations diminishes as well. Users of this information should keep in mind this qualification during the early 1980's.

*Minnesota Employment Outlook to 1985.

OUTLOOK FOR PARALEGAL ASSISTANTS

The outlook for paralegal assistants is less clear than that for lawyers or legal secretaries because it is a new and emerging occupation in some respects. The Occupational Outlook Handbook and most other information sources are silent about it. The Dictionary of Occupational Titles (DOT) lists a major title, "paralegal assistant" with "law clerk" and "legal aide" as subtitles. The definition given describes all of them as providing assistance to lawyers in the research, analysis and preparation of legal matters. Typically, law clerks are law students or attorneys working for law firms or judges temporarily as part of their career development.

Thus, the major problem in projecting the outlook for paralegal assistants is defining the occupation in measurable terms. Classifying, defining and measuring new occupations is a chronic problem for occupational and labor market analysts. Some of the job duties of paralgal assistants may also be performed by a law school graduate as well as by an experienced legal secretary either on a temporary or long-term basis. Certainly, the creation of paralegal jobs by a law firm or agency depends on its size and, to some extent, the nature of its business. Based on employer surveys administered through the Occupational Employment Statistics program (see legal secretaries) 1980 employment in these occupations was estimated as follows: Law Clerk -- 550; Paralegal Personnel -- 550.

An article in the August 1981 issue of Monthly Labor Review published by the U.S. Department of Labor projects dramatic growth in the employment of paralegals -- 132% between 1978 and 1990 in the

United States. The authors emphasize this is based on a conservative economic forecast. Based on the national trend the number of paralegals in Minnesota should more than double in this decade. If one includes law clerks and uses the 1980 estimate of 1,100 employed, over 2,200 paralegals assistants should be employed by 1990.

Training for paralegal/legal assistants is provided in both 2 and 4 year programs at the following institutions:

Four Year Programs

- University of Minnesota, General College
- Moorhead State College
- Winona State College

Two Year Programs

- Inver Hills Community College
- North Hennepin Community College
- University of Minnesota, General College

OUTLOOK FOR LEGAL SECRETARIES

Of the 3.6 million people who worked as secretaries in 1978, 162,000 worked in the legal field nationwide. In Minnesota, the number of legal secretaries rose very rapidly in the 1970's from 1,558 to 2,760, or a 77% increase through 1978. A slower, yet strong, growth rate (54%) is predicted through 1985, or a level of 4,236 legal secretaries by the mid-1980's.

In 1980, the Occupational Employment Statistics Survey* estimated 3,400 legal secretaries were employed in Minnesota. An interpolation of 1985 occupational projections published in "Minnesota Employment Outlook to 1985"* yields an estimate of 3,200 legal secretaries employed in 1980. Occupational data from the 1980 Census will not be available until mid-1982.

The Minnesota Department of Economic Security, in its 1980 "New Hires Study," indicates that 356 legal secretaries had been hired in the State between December 1979 and November 1980. Interestingly enough, annual average job openings for the period 1978-85 are estimated at 357 annually.

A total of 250 graduates of legal secretary courses were reported by public post-secondary vocational school follow-up surveys with 76% employed in related fields within a year of graduation. A total of thirteen, or 5.2% of the graduates were available for work but unemployed one year after graduation. Information on the numbers graduating from the State's community colleges or private post-secondary "business" schools is not now available; thus, estimates of total supply to compare to projected annual openings (357) cannot be prepared at this time.

First year salaries ranged from $300 per month to $1200 per month with a median wage of $700-800 per month. This data was also collected by the postsecondary vocational institutions one year after graduation, between July 1980 and June 1981.

Legal secretary programs were available at 24 of the 33 AVTI's around the State. For program descriptions, locations, etx., please call 296-6481 within the Twin Cities metropolitan area. Those living outside the 7-county metropolitan area should call the toll free number 1-800-652-9021.

Many of the public community colleges offer legal secretary programs or general secretarial with legal specializations. In addition, 7 private "business" schools offer legal secretary programs.

High school students and counselors may access the same information via Minnesota Career Information System (MCIS) terminals.

*Prepared by the Minnesota Department of Economic Security.

Source: Minnesota Occupational Information Coordinating Committee. Career Briefs...Introducing A New Series of Articles. News-Net, Vol. III, No. 1, January, 1982, p. 4-5.

It seems the most appropriate, one source of information on job openings available from the Minnesota Department of Economic Security is that entitled, Minnesota Employment Outlook to 1985. The most recent edition is January, 1981. A special edition for the Minneapolis/St. Paul area was published in March, 1982. A sample of the format of data in this publication is shown in Exhibit 18. While this publication provides a good overview of the projected occupational requirements, the difficulty for use in vocational education planning is in matching vocational education program titles and occupational titles. For some programs there is a close match and for others the match is impossible to make with any accuracy. Some attempts have been made by the MRDC to relate programs and occupation as shown in the format developed for the labor market supply/demand tables in the Minnesota State Plan for Vocational Education (See Exhibit 19). As can be seen there is much left to be done in identifying occupations related to each program and relating the classification systems for programs and occupations.

During the course of the project described in this report an attempt was made to become familiar with new efforts being made to improve labor market demand and supply information in Minnesota. Two particularily relevant efforts were identified under the direction of Rudy Pinola in the Research and Planning Section of the Minnesota Department of Economic Security.

One of these efforts focused on trying to define what is meant by a "shortage" and "surplus" in the labor market. The issues under investigation were: (1) the actual ratios of job openings to job applicants which were considered to be a shortage, surplus or balance market for a selected sample

Exhibit 18

Sample of Information from Minnesota Employment Outlook to 1985

ELECTRICIANS

Employment 1978	10,960
Projected 1985 Employment	12,300
Percent Growth 1978-1985	12.2
Total Openings 1978-1985	3,250
Expansions	1,340
Replacements	1,910

Major Industrial Employers 1978 - Manufacturing; Construction, Mining.

Job Replacements - Most training authorities recommend completion of a four year apprenticeship program as the best way to learn the trade. Many workers learn informally by working as helpers for many years. Many helpers obtain additional knowledge through trade school or the Armed Forces.

EXCAVATING, GRADING MACHINE OPERATORS

Employment 1978	7,660
Projected 1985 Employment	8,510
Percent Growth 1978-1985	11.1
Total Openings 1978-1985	2,500
Expansions	850
Replacements	1,650

Major Industrial Employers 1978 - Construction; Mining.

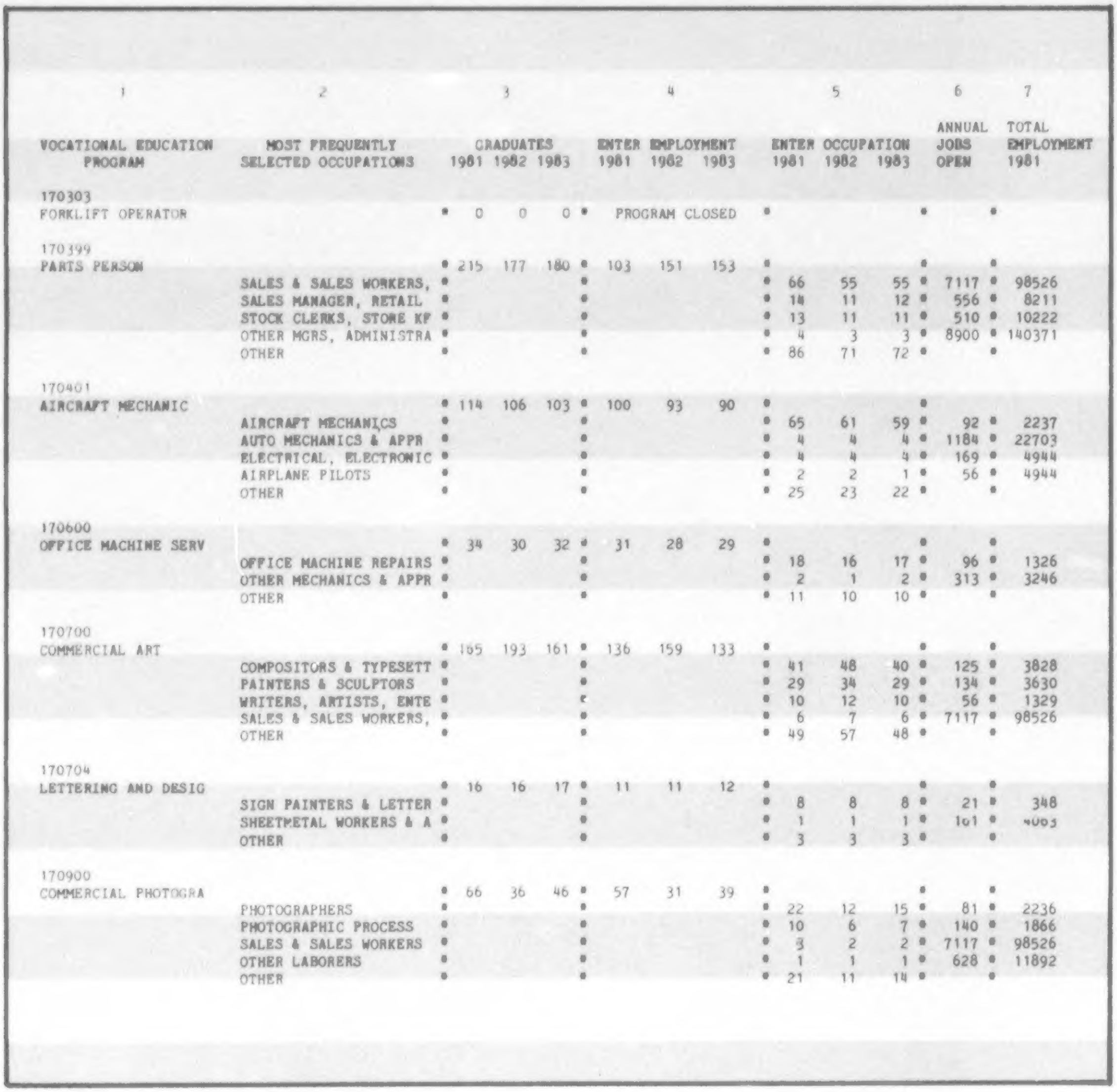
Job Replacements - Many construction machinery operators learn their skills on the job, but most training authorities recommend completion of a three year apprenticeship as the best way to learn the job. Since apprentices learn to operate a variety of machines, they have better job opportunities.

Source: Minnesota Department of Economic Security. Minnesota Employment Outlook to 1985. St. Paul, MN: Minnesota Department of Economic Security, January, 1981, p. 61.

of occupations, (2) the difference in definition as viewed by various groups such as employers and job applicants, and (3) other factors which should be considered in defining a shortage and surplus. These definitions would seem critical to decisions about how many people to train in vocational education programs.

A second study being conducted by the Department of Economic Security focused on trying to define homogeneous occupational groupings. That is, occupational titles or categories which were very similar in acceptable qualifications for job applicants. The point being examined was that many occupational titles may be too "general" for meaningful use in relating labor

Exhibit 19. Sample of Supply/Demand Information in Minnesota State Plan for Vocational Education.



1	2	3			4			5			6	7
VOCATIONAL EDUCATION PROGRAM	MOST FREQUENTLY SELECTED OCCUPATIONS	GRADUATES			ENTER EMPLOYMENT			ENTER OCCUPATION			ANNUAL JOBS OPEN	TOTAL EMPLOYMENT 1981
		1981	1982	1983	1981	1982	1983	1981	1982	1983		
170303 FORKLIFT OPERATOR		0	0	0	PROGRAM CLOSED							
170399 PARTS PERSON		215	177	180	103	151	153					
	SALES & SALES WORKERS,							66	55	55	7117	98526
	SALES MANAGER, RETAIL							14	11	12	556	8211
	STOCK CLERKS, STORE KP							13	11	11	510	10222
	OTHER MGRS, ADMINISTRA							4	3	3	8900	140371
	OTHER							86	71	72		
170401 AIRCRAFT MECHANIC		114	106	103	100	93	90					
	AIRCRAFT MECHANICS							65	61	59	92	2237
	AUTO MECHANICS & APPR							4	4	4	1184	22703
	ELECTRICAL, ELECTRONIC							4	4	4	169	4944
	AIRPLANE PILOTS							2	2	1	56	4944
	OTHER							25	23	22		
170600 OFFICE MACHINE SERV		34	30	32	31	28	29					
	OFFICE MACHINE REPAIRS							18	16	17	96	1326
	OTHER MECHANICS & APPR							2	1	2	313	3246
	OTHER							11	10	10		
170700 COMMERCIAL ART		165	193	161	136	159	133					
	COMPOSITORS & TYPESETT							41	48	40	125	3828
	PAINTERS & SCULPTORS							29	34	29	134	3630
	WRITERS, ARTISTS, ENTE							10	12	10	56	1329
	SALES & SALES WORKERS,							6	7	6	7117	98526
	OTHER							49	57	48		
170704 LETTERING AND DESIG		16	16	17	11	11	12					
	SIGN PAINTERS & LETTER							8	8	8	21	348
	SHEETMETAL WORKERS & A							1	1	1	161	4063
	OTHER							3	3	3		
170900 COMMERCIAL PHOTOGRA		66	36	46	57	31	39					
	PHOTOGRAPHERS							22	12	15	81	2236
	PHOTOGRAPHIC PROCESS							10	6	7	140	1866
	SALES & SALES WORKERS							3	2	2	7117	98526
	OTHER LABORERS							1	1	1	628	11892
	OTHER							21	11	14		

Source: Minnesota State Department of Education. Minnesota State Plan for Vocational-Technical Education. St. Paul, MN: Minnesota State Department of Education, 1981, p. 94.

supply and demand. For example, the occupational title of "carpenter" contains a wide array of sub-occupational categories which vary considerably in acceptable applicant qualifications (i.e., from being physically strong and not having any particular training to having specific supervisory personal characteristics, specific training, and several years of work experience). Of relevance to vocational education is that its programs may prepare acceptable job applicants for only a certain range of these sub-occupations within carpentry and there may or may not be demand for these types of applicants--none of which would be evident from just examining labor demand information for the broad occupational title of carpenter. Findings from these two studies will be available in the next year or so.

A Proxy Measure for Projected Job Openings

In view of this context, it is proposed that a proxy measure for job openings information be used for the process of prioritizing vocational education programs in terms of labor market demand or in conjunction with other available labor market demand information. The proposal is that the measure to be used is "percent of program graduates placed in related occupations."

Advantages and disadvantages. The advantage of using percent related placement is that it gives a very specific measure of the ability of graduates to obtain jobs for which they were prepared. It is specific to the training provided and labor market encountered by the graduates. The assumption made is that if graduates can get related jobs, labor market demand exists and/or graduatres can successfully compete with other sources of labor supply for these openings. Further, information on percent related placement is readily available from the follow-up system for the past several years.

The disadvantage of using precent related placement as a measure of occupational demand is that there may be reasons other than low demand which account for low related placement. For example, the graduates may not have received the "right" training (i.e., program was appropriate but curriculum inappropriate) or they may not have learned (i.e., program and curriculum appropriate but little learning took place). The information is always at least a year old since it is derived from former graduates approximately a year after leaving school. Also critical as a limitation is that this type of information is not availabe for programs that have not been operated at least once. This latter limitation is especially relevant to decisions about starting new programs; however, it may be possible to use information from closely related programs or programs operated by other agencies or institutions.

Perhaps these limitations are somewhat compensated for by the information's specificity to a particular training program and geographic area, also for some occupations, the demand does not change radically from year to year.

Typical information. The information (simulated) for a sample of programs for the percent related placement might appear as in Table 12.

Table 12
Information (simulated) About Percent
Related Placement for a Sample of Programs

Program	Related placement(%)
Program A	80
Program B	75
Program C	60
Program D	90
Program E	40

Process of assigning priorities. The assignment of vocational education program priority based on the above indicator could be done very generally or in greater specificity through some form of indexing. For example, a general rating process is illustrated in Figure 22. The information on related placement could be placed on a line and programs arbitrarily assigned a high, middle or low rating based on their percent related placement.

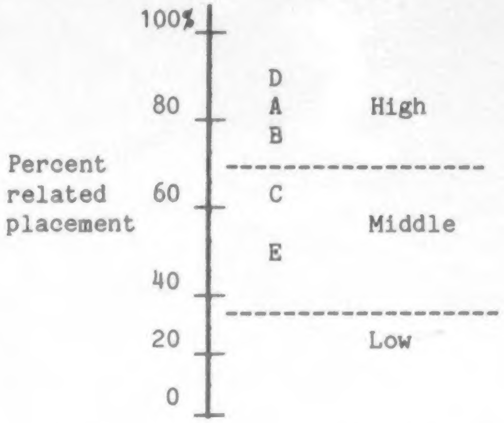


Figure 22. General rating of programs in terms of labor demand using percent related placement as a proxy measure.

A more specific indicator of program priority in terms of labor market demand could be developed by converting the information on related placement to index numbers. For example, related placements could be indexes such that 100 is set as the average percent related placements across all programs. For the five sample programs, this average is 71 percent [(80 + 75 + 60 + 90 + 50)/(5)]. Given that related placement of 71 percent is indexed at 100, then a related placement of 60 percent is equal to (100)(60)/71=85. If this process of indexing were used, the results would appear as in Table 13.

The index resulting from either the general or this specific rating of programs in terms of labor market demand using the proxy of percent related placement could then be considered together with indicators representing other important factors (e.g., employer satisfaction, cost) in planning, reviewing and providing public information about vocational education.

Table 13
Results of Using Indexing to Derive a More Specific Rating of Labor Market Demand for a Program Using the Proxy Measure of Percent Related Placement

Program	Index of related placement
Program A	113
Program B	106
Program C	85
Program D	127
Program E	70

Note: 71% = 100 for related placement.

An Underlying Principle in Considering Projected Job Openings Information as an Indicator

Underlying the development of an indicator of job openings or labor market demand more generally is the proposed notion that vocational education is first responsive to people and then to the labor market. The idea is that vocational education program outputs should be responsive to labor market demand in relative terms rather than absolute terms. For example, let's assume vocational education faced a very simple world with only three possible occupations and a program designed for each occupation. Further, assume there are only 100 job openings and three possible situations in terms of number of people wanting training -- they are 50 people want training, 100 people want training, and 200 people want training. The principle being advocated is that using only the factor of labor market demand, vocational education should prepare all of the people wanting training in each situation. (There may well be other factors such as a budget constraint which would prevent this from happening).

However, in each situation the number of persons prepared by each of the programs would change. This number is shown in Table 14. The point is that the proportions of persons in each program would remain the same across the three situations -- vocational education is responsive in relative terms. But, as shown for the situation where there is 200 who want training and only 100 job openings, vocational education is not responsive in absolute terms. Rather, all people who want training are served but in proportions relative to labor market demand for each occupation. In this example, occupations are treated as being of equal importance -- this could be changed if a measure such as wages were used to indicate the relative importance of each occupation.

Table 14
Response of Vocational Education to Various
Labor Market Demand Situations

Occupation/program	Labor market demand	Number in each program 50 want training	 100 want training	 200 want training
A	20	10	20	40
B	50	25	50	100
C	30	15	30	60
Total	100	50	100	200

Occupations for Which Programs Are Designed to Provide Training

Before one is really able to derive information about the percent of graduates entering related occupations or the responsiveness of vocational education programs to labor market demand, it is necessary to define which programs "relate" to which occupations. This has not been done in Minnesota. That this indicator is fraught with many issues is evident from the analysis presented in Chapter II.

The relationship between a particular vocational education program and one or more occupations could take any of the forms shown in Figure 23. A program could be related to a single occupation (e.g., practical nursing) or to several occupations (e.g., auto mechanic). Also, a single occupation could be related to several programs (e.g., hardware store sales person).

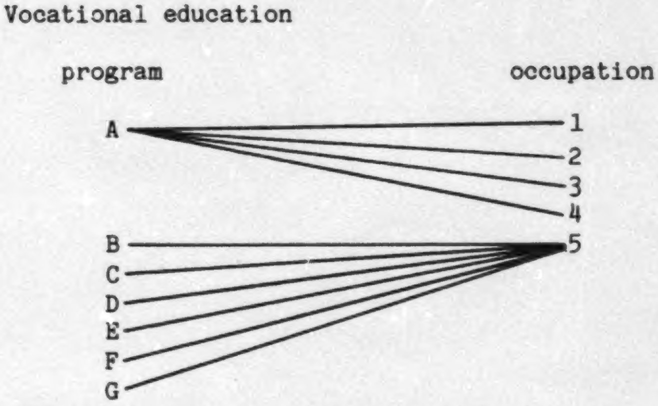


Figure 23. Relationship of vocational education program to specific occupations.

Several efforts have been made to relate vocational education programs to occupations and vice-versa. For example, Table 15 shows the results of work by the MRDC in 1977 indicating the occupations entered by graduates of the post secondary carpentry programs. Table 16 shows the programs having graduates who entered the carpentry occupation. Some of this process has been incorporated into the labor market supply/demand tables in the Minnesota State Plan for Vocational Education.

Table 15

Proportion of Carpentry Graduates Entering Various Occupations (1977)

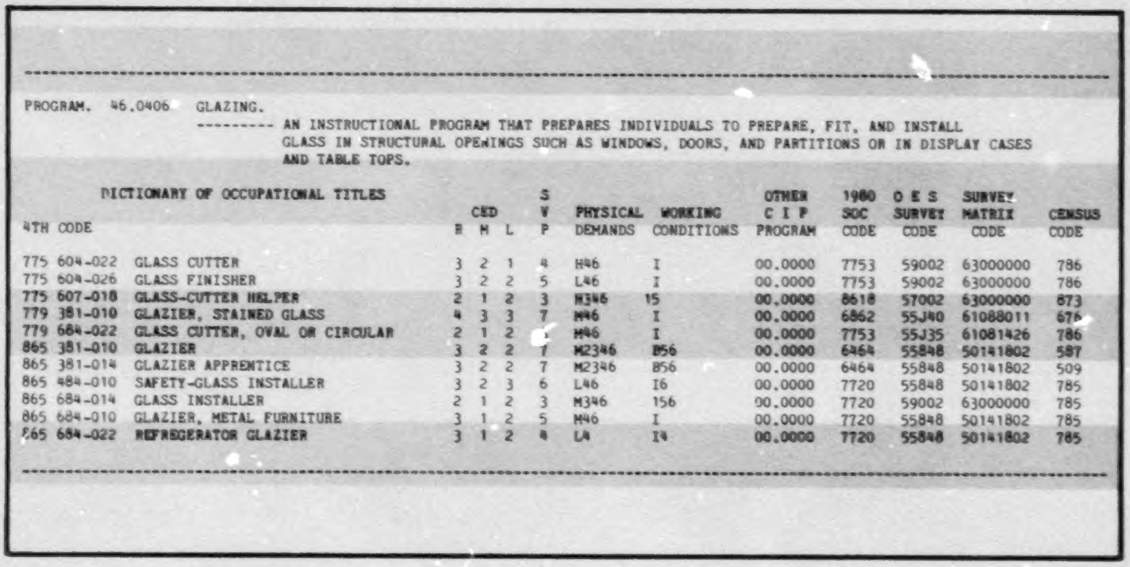
Sales Managers and Department Heads Retail Training	.01
Sales Managers Except Retail Trade	.01
Salesmen and Sales Nec.	.02
Cabinetmakers	.02
Carpenters	.65
Carpenter Apprentices	.11
Compositors and Typesetters	.01
Excav., Grdg., Rd. Mchn. Operator Exc. Boozer	.01
Automobile Body Repairmen	.01
Miscellaneous Mechanics and Repairmen	.02
Pressmen Plate Printers, Printing	.01
Mine Operatives Nec.	.01
Machine Operatives, Miscellaneous Specified	.03
Deliverymen and Routemen	.02
Gardeners, Groundskeepers Exc. Farm	.01
Miscellaneous Laborers	.01
Janitors and Sextons	.04
	1.00

Table 16

Proportion of Graduates of Various Programs Entering Carpenters Occupation (1977)

Carpentry	.72
Mechanical Draft and Design	.01
Architectural Draft and Design	.04
Machine Shop	.01
Welding	.02
Chefs, Cooks, Food Preparation	.02
Cabinetmaking	.02
Marine and Small Engine Mechanics	.01
Bricklayer	.01
Refrigerator, Air Conditioning, Heat, Appliance Repair	.01
Agri-Technology	.01
Accounting	.01
Farm Management	.01
Telephone Communication Tech	.01
Conservation and Forestry	.01
Photographic Technology	.01
Construction Worker	.01
General Sales	.03
Business Management	.01
	1.00

Exhibit 20. Crosswalk of Vocational Education Programs and Occupations Developed by NOICC.



PROGRAM. 46.0406 GLAZING.
--------- AN INSTRUCTIONAL PROGRAM THAT PREPARES INDIVIDUALS TO PREPARE, FIT, AND INSTALL GLASS IN STRUCTURAL OPENINGS SUCH AS WINDOWS, DOORS, AND PARTITIONS OR IN DISPLAY CASES AND TABLE TOPS.

DICTIONARY OF OCCUPATIONAL TITLES 4TH CODE		GED R	GED M	GED L	S V P	PHYSICAL DEMANDS	WORKING CONDITIONS	OTHER C I P PROGRAM	1980 SOC CODE	O E S SURVEY CODE	SURVEY MATRIX CODE	CENSUS CODE
775 604-022	GLASS CUTTER	3	2	1	4	H46	I	00.0000	7753	59002	63000000	786
775 604-026	GLASS FINISHER	3	2	2	5	L46	I	00.0000	7753	59002	63000000	786
775 607-018	GLASS-CUTTER HELPER	2	1	2	3	M346	15	00.0000	8618	57002	63000000	873
779 381-010	GLAZIER, STAINED GLASS	4	3	3	7	M46	I	00.0000	6862	55J40	61088011	676
779 684-022	GLASS CUTTER, OVAL OR CIRCULAR	2	1	2	[illegible]	M46	I	00.0000	7753	55J35	61081426	786
865 381-010	GLAZIER	3	2	2	7	M2346	B56	00.0000	6464	55848	50141802	587
865 381-014	GLAZIER APPRENTICE	3	2	2	7	M2346	B56	00.0000	6464	55848	50141802	509
865 484-010	SAFETY-GLASS INSTALLER	3	2	3	6	L46	I6	00.0000	7720	55848	50141802	785
865 684-014	GLASS INSTALLER	2	1	2	3	M346	156	00.0000	7720	59002	63000000	785
865 684-010	GLAZIER, METAL FURNITURE	3	1	2	5	M46	I	00.0000	7720	55848	50141802	785
865 684-022	REFREGERATOR GLAZIER	3	1	2	4	L4	I4	00.0000	7720	55848	50141802	785

Source: National Occupational Information Coordinating Committee. Vocational Preparation and Occupations. Washington, D.C.: National Occupational Information Coordinating Committee, 1982.

In addition a national effort has been made by the National Occupational Information Coordinating Committee (NOICC) (1982) to develop a "crosswalk" between vocational education programs and various occupational classification schemes. A sample of their results is shown as Exhibit 20. A computer tape now exists which contains this information for upwards of 200 vocational education programs. Additionally NOICC has recommended and developed a process for deriving "units of analysis" which are grouping of occupations that are reasonable and practical to think about when planning educational programs (National Occupational Information Coordinating Committee, 1982).

Most recently, the MRDC has been examining the use of student's judgements of relatedness to identifying occupations related to a particular vocatinal education program. Former students are asked through the follow-up system if their present jobs are related, somewhat related, or unrelated to the program from which they graduated. A sample of this information for the farm equipment mechanics program is shown as Table 17. An analyses of this kind for all programs for several years combined with the crosswalk information and unit of analysis concept provided by the National Occupational Information Coordinating Committee could result in a consistent and agreed upon set of related occupations for each vocational education program. Lack of consistent and stable definition of occupations related to each program category will constrain the accurate interpretation of any relatedness information and use of labor market demand information in planning reviewing and providing public information about vocational education in Minnesota.

Table 17

Using Students' Judgements to Indicate Related Occupations: Farm Equipment Mechanics Program, 1974-1976

Occupation entered	Number entering	Percent indicating related
Not specified mechanics and repairs	11	100%
Heavy equipment operators	7	100
Miscellaneous mechanics and repairs	3	100
Delivery and route workers	2	100
Stock clerks and store keepers	1	100
Supervisors, nec	1	100
Assemblers	1	100
Garage workers and gas station attendants	1	100
Farm implement mechanics	30	90
Farm supervisors	14	86
Farmers	4	75
Managers and administrators, nec	3	66
Sales clerks, retail trade	2	50
Welders and flame cutters	2	50
Sales persons, retail trade	1	0
Carpenters	1	0
Automobile mechanics	1	0
Mill wrights	1	0
Machine operatives, not specified	1	0
Motor workers: mine, factory, logging camps	1	0
Truck drivers	1	0
Construction laborers, exc. carpenters' helpers	1	0
Miscellaneous laborers	1	0
Total	90	81

Summary

The focus of this chapter was on further development of those indicators which were judged to be important but did not have adequate data readily available for pursuing the developmental steps described in Chapter III. Instead, an attempt was made to analyze existing information toward making recommendations for its use and improvement. The summary points which seem justified are as follows:

- While much labor market information is available, none in sufficiently specific complete, or compatible with that available for vocational education programs for use in indicator development.
- It may be reasonable to use proxy measures of labor market demand derived from follow-up information on graduates of vocational education programs as a "stop-gap" mechanism in combination with existing labor market demand information until more adequate information is available.
- Little progress can be made in using labor market information to develop a relevant vocational education indicator until a consistent and stable set of occupations related to each program is specified. The use of existing "crosswalks" between occupations and programs, the concept of "units of analysis" and existing follow-up information on occupations judged "related" by students after good possibility to resolve the relatedness issue at least in terms of the best means to use for this purpose.

CHAPTER V.
NEXT STEPS IN INDICATOR DEVELOPMENT

The purpose of this chapter is to look across the work reported on in previous chapters in terms of the general problem area of further developing adequate vocational education indicators in Minnesota. Each of the above chapters already has a summary section describing major conclusions of each separate effort.

Looking then across the chapters, the following recommendations seem in order:

- The process of indicator verification and development must be continous. The results of the efforts described in this report suggest progress has been made but that there are many ways to improve what has been done. New indicators need to be considered especially in view of current social and economic issues facing the nation and more particularilly Minnesota. Indicators must be linked to an overall purpose of vocational education as might be formulated in a mission statement. A conceptual framework is needed to related indicators to one another and insure comprehensive coverage of the phenomenon labeled vocational education. Each indicator must be critically examined in terms of the ends it is directed toward, what it really means and how it is to be measured. Several other verification strategies suggested, but not tried, in this project need to be examined for their use in assisting responsible individuals to feel more confident about the indicators eventually selected (e.g., obtaining views of groups such as parents, teachers, students, school board members, employers, and legislators; examining indicators from a futurist's perspective; linking indicators to the leading economic indicators for Minnesota; examining the history of development of accepted indicators such as the unemployment rate for lessons in indicator development). For certain indicators, data needs to be improved substantially either by making new and creative use of available data or gathering new forms of data. Other indicators, with adequate quality of data, need refinment in operational definitions, display structure and format and in setting appropriate benchmarks.
- The need for both reflective thought and experience are important to indicator development. There is a symbiotic or "hybrid effect" of

being engaged in rather theoretical discussions about what would be ideal indicators and, at the same time, to be engaged in actually constructing indicators from what is available. Reflective thought provided direction, criteria and coherence for judging experience; experience provides relevance, tangibility and a sharpness of questioning. Discussion and thought could and should go on forever but at least as much likely will be learned by doing--actual development and use of indicators using best judgement and what information is available. The tension between "not being sure" yet "having to do" is productive to indicator improvement.

- Some of the indicators must be pushed to the stage of actual use in planning, review and providing public information. The real test of the viability of the indicator concept will only come with use over a period of time in real life situations. Only here will the limitations of indicators, especially in terms of consequences, be most clearly exposed for consideration. And, if the indicators are used, the rationale for their continuance and improvement will be provided. A major next step in indicator development, following the step of setting benchmarks, will be the interpretation of what an indicator is implying for vocational education in general or for specific programs--what does it mean. Also during use, aspects of indicator feasibility such as staff training needs, scheduling deadlines, degree of accuracy, and operating costs will be more readily apparent.

- Involvement of those using and affected by use of the indicators is a necessary part of indicator development. The Work Group used in this project provided important insight and perspective to the activities which were a part of this project. Some of this advice is most likely to only come from individuals who would have staff responsibility to actually calculate and interpret indicators, make decisions based on the interpretation of indicators as a major input or bear the consequences of decisions made using indicators. With shared responsibility and involvement during indicator development, these same individuals gain an understanding and committment to indicator use that can be, at most, approached superficially on a post hoc basis. Involvement of affected individuals adds a discipline and seriousness to the effort that would be difficult to "spark" in other ways.

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APPENDIX I.
AGENDAS FOR WORK GROUP MEETINGS

Tentative Agenda for Work Group on Vocational Education Indicators

(10:30 a.m. - 12:30 p.m., June 15, 1982)

Meeting No. 1

1. Review purpose of research project and work group. (15 minutes)
2. Sharing of experience with development or use of "indicators idea" by work group members. (30 minutes)
3. Examine progress in identification of vocational education indicators for Minnesota. (30 minutes)
4. Discussion of "next-steps" in indicator identification and development. (40 minutes)
5. Plans for next meeting. (5 minutes)

Goal for Meeting

Concensus on reasonable next steps in the development of vocational education indicators for Minnesota.

Tentative Agenda for Work Group on Vocational Education Indicators

(1:00 - 3:30 p.m., July 14, 1982)

Meeting No. 2

1. Review discussion at last meeting and tentative decision as to direction for Vocational Education Indicators Project. (15 minutes)

2. Further verification of vocational education indicators in terms of:

    - -- Vocational education as responsive to current social and economic needs.
    - -- Vocational education as a part of education. (45 minutes)

3. Operational definitions for those indicators with adequate data:

    - -- Employer's satisfaction with quality of graduate work.
    - -- Graduates employed.
    - -- Graduates employed in occupations related to program.
    - -- Program cost. (40 minutes)

4. Developing better data for those indicators with inadequate data:

    - -- Projected job openings in occupations related to program. (Briefing on new efforts by the Minnesota Department of Economic Security).
    - -- Occupations for which program is designed to provide training. (40 minutes)

5. Set time and focus of next meeting. (10 minutes)

Tentative Agenda for Work Group on Vocational Education Indicators

(9:00 - 11:30, August 10, 1982)

Meeting No. 3

1. Review of discussion at last meeting and agenda for this meeting. (15 minutes)

2. Discussion of paper shared at last meeting by Joe Malinski. (15 minutes)

3. Operational definitions for those indicators with adequate data

   -- Criteria for operational definitions
   -- Criteria for displaying indicators
   -- Setting benchmarks
   (40 minutes)

4. Further verification of vocational education indicators

   -- Your educational philosophy
   -- Alternative visions of vocational education
   -- Implications for important indicators
   (55 minutes)

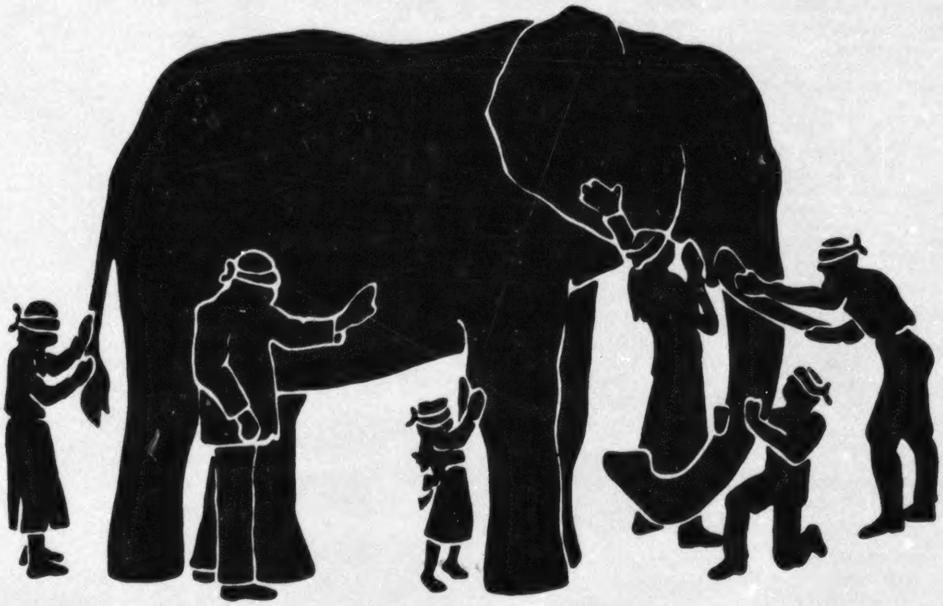
5. Advice on future steps for indicator development. (20 minutes)

6. Closing remarks for work group. (5 minutes)

APPENDIX II.
MINNESOTA ANALYSIS OF BELIEFS IN EDUCATION

User's Guide to Accompany

MINNESOTA ANALYSIS OF BELIEFS IN EDUCATION



BELIEFS ARE THE RESULT OF EXPERIENCE... SEE INSIDE

Minnesota Department of Education
Division of Instruction
Elementary and Secondary Education Section (ESES)
650 Capitol Square Building
St. Paul, Minnesota 55101

The Blind Men and the Elephant

John G. Saxe

It was six men of Indostan
  To learning much inclined,
Who went to see the Elephant
  (Though all of them were blind),
That each by observation
  Might satisfy his mind.

The First approached the Elephant,
  And happening to fall
Against his broad and sturdy side,
  At once began to bawl:
"God bless me! but the Elephant
  Is very like a wall!"

The Second, feeling of the tusk,
  Cried, "Ho! what have we here
So very round and smooth and sharp?
  To me 'tis mighty clear
This wonder of an Elephant
  Is very like a spear!"

The Third approached the animal,
  And happening to take
The squirming trunk within his hands,
  Thus boldly up and spake:
"I see," quoth he, "the Elephant
  Is very like a snake!"

The Fourth reached out his eager hand,
  And felt about the knee.
"What most this wondrous beast is like
  Is mighty plain," quoth he;
"'Tis clear enough the Elephant
  Is very like a tree!"

The Fifth, who chanced to touch the ear
  Said, "E'en the blindest man
Can tell what this resembles most;
  Deny the fact who can,
This marvel of an Elephant
  Is very like a fan!"

The Sixth no sooner had begun
  About the beast to grope,
Than, seizing on the swinging tail
  That fell within his scope,
"I see," quoth he, "the Elephant
  Is very like a rope!"

And so these men of Indostan
  Disputed loud and long,
Each in his own opinion
  Exceeding stiff and strong.
Though each was partly in the right,
  And all were in the wrong!

Minnesota Analysis of Beliefs in Education: A Description

The Minnesota Analysis of Beliefs in Education (MABE) is an information-gathering tool designed to provide technical assistance to schools and school districts. MABE is a low-cost, standardized way to discern the belief systems of groups of people, such as staff members, parents, and other community members. MABE provides an inventory of beliefs and assumptions. MABE functions neither to promote any particular set of beliefs or assumptions nor to direct educational decisions. Rather, it is an inventory for the collection of data — the use of which enables educational decision-making to be more thorough and productive.

Rationale

In the face of conflict we often neglect to recognize that conflict is rooted in differences of beliefs and assumptions people hold. Similarly, efforts to implement particular educational programs or practices are frequently frustrated because of the conflict resulting from these same differences of beliefs and assumptions.

On the other hand, educators are frequently criticized because of their apparent inability or failure to relate beliefs/assumptions and educational practices. Venable has succinctly described this state:

> Consistency between beliefs and the development of practices growing out of these beliefs are all too rare among those of us who are concerned with education.
>
> Lacking this consistency, we may find ourselves giving lip service to two or more conflicting views, or professing one belief while our behavior evidences another, or—worst of all—allowing our behavior to be determined by forces that bear no relationship to any particular set of principles.
>
> (Venable, T.C., Philosophical Foundations of the Curriculum, Chicago: Rand McNally and Co., 1967, pages 9-10.)

The MABE inventory allows individuals and groups to review the systematic beliefs from five traditional schools of philosophy and to see where their own beliefs and assumptions tend to cluster. Such information helps the school or school district to recognize the consistency or lack of consistency among generally held beliefs and the existing school programs and practices. It also helps predict potential difficulties surrounding the implementation of new programs or practices to the extent that the relationship between the beliefs of the various publics involved and the new programs or practices can be identified and analyzed. In all of this, the MABE inventory is a possible resource for gathering information which should assist in determining the causes of educational conflict, actual or potential.

Schools or school districts typically attempt to develop an educational philosophy and goals that are reflective of the community and staff. MABE holds the promise of providing basic information upon which to base philosophy and goals. So, whether the desire is to understand the basic belief orientation of a group of education professionals or of the community, this inventory can be a valuable aid.

In short, MABE helps assess the general philosophic positions of selected groups of individuals. The information gathered from the use of the inventory ought to be of value in setting educational goals, resolving conflict and providing significant data for decision-making.

Summary Information Obtained from MABE

MABE covers three broad areas: Human nature, knowledge, and values. It consists of 90 items which are written in nontechnical language. The content of the items relates to the beliefs of five different philosophical approaches.

An individual's response to the 90-item inventory can be collapsed onto a graph which shows the set of beliefs the individual tends to subscribe to from the traditional schools of philosophy, and the set of beliefs the individual does not agree with. The responses, as graphed, show how ideas cluster around a particular philosophical position or spread across several philosophies.

Composite scores can be obtained for an entire group of people and these, too, can be graphed. In this way, comparisons can be made across groups of people with respect to how closely they are likely to agree about what human beings are like, how they learn, what they should be taught and how they acquire values.

It is important to reiterate that the individual or group profiles gathered as a result of the use of the MABE inventory do **not** require any particular action. Information obtained from MABE does provide data about the assumptions/beliefs held by the participants—assumptions/beliefs that affect a point of view regarding educational programs and practices.

Philosophic Positions

In order to facilitate the use of MABE, brief descriptions of the five philosophic positions are presented. While it is not possible to represent these five schools of philosophy adequately with a few statements, the general descriptions provided are presented as a means of underscoring the differences that exist among the philosophic approaches represented. Users of MABE are reminded that many excellent texts are available which detail these philosophic positions.

Idealism

This very early philosophic position maintains the dominance of the world of ideas over the world of sense reality. Therefore, emphasis is given to mental discipline, the development of ideas and concepts, and the search for universal truths.

It is the work of education, according to the Idealist, to assist students in discovering the ideal truths that exist. This is commonly accomplished through such academic fields as history, mathematics, and literature.

The Idealist believes that absolute and unchanging values exist. These values are timeless and are found in each society and throughout history. Through the use of reason and logic, the human person can support belief in such values.

Essentialism

Essentialism takes its name from the fact that there exist certain essential knowledge and beliefs. This knowledge and these beliefs are knowable.

Typically the Essentialist position unites the main beliefs of two other philosophical schools of thought: Idealism and Realism. Realism is a philosophic position which advocates the objective reality of our world.

Essentialism often has been linked with traditional religious beliefs. This results primarily from the Essentialist view of the student as a fugitive from learning—an assumption which corresponds to the doctrine of original sin or the sin of Adam and Eve. In other words, human nature is thought to be inclined toward "evil." The instructor must practice consistent discipline in order to assist the student in developing the self discipline required for learning and a worthwhile life.

Essentialists view the teacher as a master of learning. There is a knowable body of knowledge that teachers share with students in leading them to become well-educated adults.

As with the Idealist position, Essentialism acknowledges the existence of absolute and unchanging values.

Pragmatism

This philosophic position is associated with the later progressive movement in American education. Pragmatists contend that truth is found in that which works. An idea is tested by examining its consequences; the degree to which the consequences are acceptable is the degree to which truth exists.

The Pragmatist does not simply advocate something that is seen to be useful for an individual. Rather, truth is that which helps us move toward what is progressively good for our community or society.

In other words, truth is relative and will vary according to time and place. Therefore, for the Pragmatist there are no absolute or changeless truths or values, other than perhaps Pragmatism itself.

Reality, for the Pragmatist, is viewed as one's experiences. One's experience in trying to know or solve problems accounts for one's relationship with the real world. This relationship is viewed as a process. In fact, the Pragmatist position is said to be process-oriented.

In education, the Pragmatic point of view encourages students to learn through experiences of the real world, both physical and social, and to solve problems associated with those experiences.

Existentialism

The Existential position focuses on the individual. Each person is thought to be unique and, therefore, efforts to impose group values upon the individual are not acceptable.

In order to cultivate and maintain the unique character of the individual, a high degree of personal freedom is required. The person is not in search of some ideal or absolute truth. The individual strives to come to know his/her own being and person. For it is in knowing who the individual is that he/she can determine what reality is.

Similarly, each individual, given personal freedom, determines the values that are important. It is obvious that this philosophic position is subjective in its attention to the individual and to the individual's personal determination of truth and values.

In education, the Existentialist assists students to create their own unique existence and being, and to recognize and practice personal freedom. Through personally selected experiences, the individual grows in self knowledge and achieves self-fulfillment.

Behaviorism

Two separable aspects of a system which is derived from psychology are: Behaviorism as a philosophic position and behavioral engineering as a technology. The philosophic position asserts that the human person is conditioned in all phases of life to respond and react in certain ways. Knowing this, it becomes clear that the human behavior is not free, but rather is determined by environmental stimuli. In addition to being controlled by such obvious stimuli as those provided in our physical environment, we are also controlled by the stimuli managed by other human beings.

A stimulus can be either positive, as in a reward, or negative, as in punishment. It is believed that human behavior can be modified by establishing the "right" set of conditions. Certain members of society, usually those associated with the scientific/technological community, have the responsibility to identify the conditions which change behavior for the good of society and the individual.

Behaviorists generally are silent on the topic of values. That behavior which results in positively reinforcing stimuli is seen as good.

In education, the Behaviorist is keenly interested in maintaining the right set of conditions for producing learning, e.g., a learning environment in which correct behavior is followed by positive consequences. Stating specific behavioral outcomes of learning in some quantifiable way and modifying student behavior toward learning reflect the usual concerns and activities of those who subscribe to Behaviorism.

Preparing to Administer MABE

The person who administers MABE should become thoroughly familiar with the user's guide before administering MABE to a group. In addition, the administrator should actually take the inventory before giving it to others. This item-by-item preparation will allow the person administering MABE to share the experience of the participants.

Materials.

Initially give out to each participant the following:

- 1 copy of the MABE inventory
- 1 pencil
- 1 name tag (optional)

After the participant has taken the inventory give out:

- 1 copy of MABE Scoring Sheet and Individual Profile
- 1 MABE Description of Philosophical Positions
- 1 tally sheet for total scores of individual (optional).

Administration. There are no formal time limits set for MABE. Plan a time block of about 30 minutes to administer MABE to a group. Instructions to persons taking MABE should be to respond to the items on this forced-choice inventory by deciding whether you mostly agree or mostly disagree with each item.

The administrator should give no interpretation of the items to the participants. Often the respondent's first impression is a more reliable response than an intensive analysis of the item. It is, however, the nature of philosophical reflection to ponder and to analyze. No participant should be discouraged from doing this or rushed into a hasty decision if this is not the person's style of responding.

Tell the participants that after they have completed the inventory, they will be given a scoring sheet to determine for themselves into which of the five philosophical schools their responses tend to fall. They will also be given a sheet which briefly describes each of the five philosophical schools used in the inventory. They can use the time while they wait for others to complete the inventory to study their own responses in the light of the descriptions.

Scoring. To score his/her own responses, the participant should find the items the person mostly agreed with and circle those numbers on the scoring sheet. The items are listed on the scoring sheet under the philosophical school to which they belong. For example, in looking at responses to the first five items, if numbers 1, 3 and 4 were agreed with, the person would circle those numbers which are found under the schools of Behaviorism, Idealism, and Essentialism. The numbers 2 and 5 would be without circles since the respondent did not agree with the positions of the Pragmatism and Existentialism schools.

A sample scoring sheet for one individual is shown in this user's guide. Total scores for each of the five schools are found by adding the number of circled items. The total scores can then be plotted on the graph at the bottom of the scoring sheet.

Individual Analysis. Point out to the participants that the scoring sheet shows numbers in three separate clusters. The top third of the numbers are for items in the inventory which ask about human nature. The middle third of the numbers on the scoring sheet are items from the inventory that concern knowledge. The last third of the numbers are responses about moral and aesthetic values. An individual can look at his/her responses within schools, but it is also possible to analyze one's responses for the three areas of human nature, knowledge and values.

By studying the summary statements about the five philosophical schools, an individual can obtain an overview of those schools with which he/she most strongly agrees or disagrees. An individual may be able to search out items or areas in the inventory which indicate that the person has agreed with two contradictory beliefs.

Group Analysis. While MABE may provide insight for the individual who completes it, its primary purpose is to provide a general summary of groups of people. In attempting to determine the philosophic orientation of large groups of people, such as the total community of a school district, a random sample from that population would provide an accurate, unbiased way of assessing this group. The method of selecting this sample and the size of the sample needed are areas in which the administrator may need to obtain technical assistance.

If a group analysis is to be made, each individual should be given a small tally sheet to write the five total scores from his/her scoring sheet. In compiling information from a group at a meeting, it is important to respect the needs of the individual for anonymity. Care should be taken to collect the tally sheets in such a way that no individual's scores are known.

The administrator should add up the scores for each of the schools and divide by the number of persons who have taken the MABE inventory. This will give a group profile for responses within each philosophical school. The administrator can use the copy of the MABE Group Profile for the purpose of making a visual display of group results. For example, a transparency can be made.

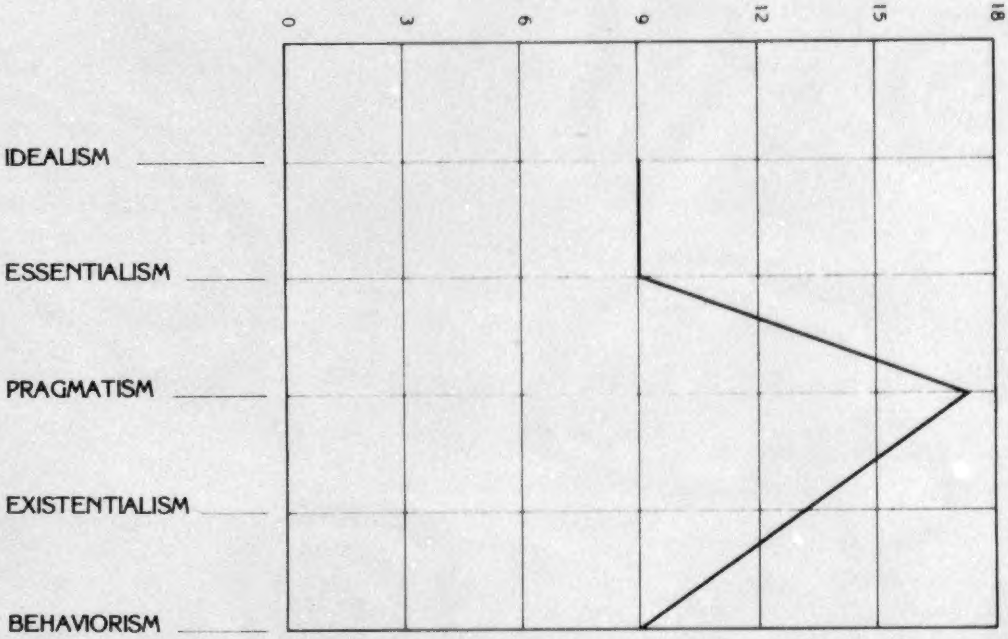
Technical Assistance. Users of MABE who wish to have technical assistance before they themselves administer the survey to a group of persons in their community may obtain this by contacting the Curriculum Director, Elementary and Secondary Education Section, Minnesota Department of Education, 550 Cedar Street, St. Paul, Minnesota 55101.

Those who would prefer to have an outsider come into their community to administer the inventory and to work with those who have taken it may also obtain this type of technical assistance from the Elementary and Secondary Education Section.

Minnesota Analysis of Beliefs in Education
Scoring Sheet

IDEALISM	ESSENTIALISM	PRAGMATISM	EXISTENTIALISM	BEHAVIORISM
[✓ 3]	4	[✓ 2]	[✓ 5]	1
10	[✓ 9]	[✓ 6]	[✓ 8]	[✓ 7]
[✓ 13]	[✓ 15]	[✓ 12]	11	[✓ 14]
[✓ 17]	20	[✓ 18]	[✓ 16]	19
21	22	[✓ 23]	[✓ 24]	25
[✓ 29]	28	[✓ 26]	[✓ 27]	[✓ 30]
35	[✓ 31]	[✓ 34]	33	[✓ 32]
[✓ 39]	36	[✓ 38]	40	37
[✓ 41]	[✓ 43]	[✓ 42]	[✓ 45]	[✓ 44]
48	[✓ 49]	[✓ 46]	[✓ 50]	[✓ 47]
[✓ 55]	[✓ 54]	[✓ 53]	52	51
[✓ 58]	56	[✓ 60]	[✓ 59]	[✓ 57]
64	65	61	[✓ 63]	[✓ 62]
68	69	[✓ 66]	[✓ 67]	70
71	[✓ 73]	[✓ 75]	[✓ 74]	72
[✓ 76]	[✓ 80]	[✓ 78]	[✓ 79]	77
84	82	[✓ 83]	85	[✓ 81]
87	[✓ 88]	[✓ 90]	[✓ 89]	86
9	9	17	13	9

Minnesota Analysis of Beliefs in Education
Individual Profile



Minnesota Analysis of Beliefs in Education
Total Scores of an Individual Response

Idealism	Essentialism	Pragmatism	Existentialism	Behaviorism
____________	____________	____________	____________	____________

Minnesota Analysis of Beliefs in Education
Total Scores of an Individual Response

Idealism Essentialism Pragmatism Existentialism Behaviorism

____________ ____________ ____________ ____________ ____________

Minnesota Analysis of Beliefs in Education
Total Scores of an Individual Response

Idealism Essentialism Pragmatism Existentialism Behaviorism

____________ ____________ ____________ ____________ ____________